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July 1, 1999

## ATTACHED TEST REPORT

Comments regarding the following test report should be made by July 22, 1999 to:

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# PRELIMINARY DRAFT

## TEST REPORT

### TOTAL HYDROCARBON EMISSIONS FROM TWO PHASE II VACUUM ASSIST VAPOR RECOVERY SYSTEMS DURING BASELINE OPERATION AND SIMULATED REFUELING OF ONBOARD REFUELING VAPOR RECOVERY (ORVR) EQUIPPED VEHICLES

Compliance Division

Project Number ST-98-XX

June 1999

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

**June 1999 DRAFT**

**TOTAL HYDROCARBON EMISSIONS FROM TWO PHASE II VACUUM ASSIST  
VAPOR RECOVERY SYSTEMS DURING BASELINE OPERATION AND  
SIMULATED REFUELING OF ONBOARD REFUELING VAPOR RECOVERY  
(ORVR) EQUIPPED VEHICLES**

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## **June 1999 DRAFT EXECUTIVE SUMMARY**

Staff from the Air Resources Board (ARB) Compliance Division (CD) performed a series of tests to evaluate the impact of onboard refueling vapor recovery (ORVR) equipped vehicles on emissions from vacuum assist Phase II vapor recovery systems. Phase II vapor recovery systems, installed at gasoline dispensing facilities throughout California, are designed to capture vapors displaced from the vehicle fuel tank during refueling. ORVR systems, installed in some new vehicles, capture these vapors in an onboard charcoal canister without the aid of Phase II vapor recovery and process them to the engine fuel system during driving.

Testing was performed at two northern California gasoline dispensing facilities: a Gilbarco Vapor Vac vapor recovery system (VRS) in El Sobrante between July 29, 1998 and August 8, 1998 and a Dresser Industries Wayne Vac VRS in Sacramento between September 8, 1998 and October 9, 1998. The Gilbarco Vapor Vac and Dresser Wayne Vac systems represent approximately 80% of **vacuum assist** systems installed in California. Together, they dispense approximately 55% of gasoline purchased within the state.

Currently, ORVR equipped vehicles account for a small fraction of the California vehicle population. The lack of available ORVR vehicles, and the difficulty in distinguishing them from vehicles with conventional fuel systems, made testing using in service vehicles impractical. Therefore, the VRS at each test facility was modified to enable conventional vehicles to simulate the interaction of ORVR vehicles with vacuum assist vapor recovery systems.

Testing was divided into two phases: 1) a baseline phase with the test facility configured for normal operation and 2) an ORVR phase performed after modifying the VRS to simulate dispensing gasoline to a vehicle fleet with an ORVR population of approximately 40%. VRS emissions were determined for each test phase by direct measurement at the pressure / vacuum (P/V) valve exhaust and fugitive emission calculations. Additional baseline and ORVR simulation tests were performed at the Wayne Vac facility with the P/V valve removed from the VRS. Removal of the P/V valve was based on the assumption that all VRS emissions would occur at the open exhaust of the vent riser. This assumption eliminated fugitive emissions calculations since the VRS could not achieve the necessary operating pressure.

Summary Table S-1 reports the daily test results for baseline and ORVR simulation testing of the Gilbarco Vapor Vac VRS. The average emission factor determined for baseline testing was 0.396 lb/1000 gal. Assuming an emission factor of 8.4 lb/1000 gal without vapor recovery, 0.396 lb/1000 gal represents a 4.71% decrease in VRS efficiency. When testing the Vapor Vac system at a simulated ORVR throughput of 44.9%, the average emission factor and VRS efficiency loss determined were 0.782 lb/1000 gal and 9.31%, respectively.

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Summary Table S-2 reports the daily results for baseline and ORVR simulation testing of the Wayne Vac VRS, both with and without the P/V valve installed on the vent riser. The results show close agreement between the emission factors (0.028 lb/1000 gal, 0.026 lb/1000 gal) and efficiency losses (0.33%, 0.31%) determined during baseline testing with and without the P/V valve, respectively. The average emission factor and efficiency loss determined for a 39.5% ORVR simulation with the P/V valve installed were 0.0524 lb/1000 gal and 0.75%. The average emission factor and efficiency loss determined for a 38.2% ORVR simulation with the P/V valve removed were 0.289 lb/1000 gal and 3.44%, respectively.

SUMMARY TABLE S-1  
ORVR Simulation with Phase II Vacuum Assist VRS  
Gilbarco Vapor Vac VRS

Test Date Ending @ 1400 hrs	Mode of Operation	Product Dispensed (gallons)	Percent ORVR Simulation	Average Vent Hydrocarbon Concentration (%C3H8)	Vent Emission Factor (lb/1000 gal)	Avg. Fugitive Emission Factor (lb/1000 gal)	Average Total Emission Factor (lb/1000 gal)	Average VRS Efficiency Loss (%)
30-Jul	Baseline	4138	0	38.7	5.56E-04	0.567	0.567	6.75%
31-Jul	Baseline	4198	0	34.0	1.21E-05	0.505	0.505	6.01%
1-Aug	Baseline	5076	0	29.6	5.14E-05	0.356	0.356	4.24%
2-Aug	Baseline	4307	0	33.7	2.72E-04	0.242	0.242	2.88%
3-Aug	Baseline	4063	0	35.4	3.13E-04	0.309	0.309	3.68%
<b>average</b>		<b>4356</b>	<b>0</b>	<b>34.3</b>	<b>2.41E-04</b>	<b>0.395</b>	<b>0.396</b>	<b>4.71%</b>
4-Aug	Transition	3646	NA	39.6	2.85E-04	0.210	0.211	2.51%
5-Aug	ORVR	4381	42.5	19.3	2.45E-04	0.418	0.418	4.98%
6-Aug	ORVR	4364	44.7	16.3	4.46E-02	0.626	0.671	7.99%
7-Aug	ORVR	4355	44.6	17.9	1.01E-01	0.706	0.807	9.61%
8-Aug	ORVR	4061	48.8	22.5	2.04E-01	0.933	1.137	13.54%
9-Aug	ORVR	4017	44.0	26.6	2.22E-01	0.656	0.878	10.45%
<b>average</b>		<b>4236</b>	<b>44.9</b>	<b>20.5</b>	<b>1.14E-01</b>	<b>0.668</b>	<b>0.782</b>	<b>9.31%</b>

average values do not include transition periods.

SUMMARY TABLE S-2  
ORVR Simulation with Phase II Vacuum Assist VRS  
Wayne Vac VRS

Test Date Ending @ 2100 hrs	Mode of Operation	Product Dispensed (gallons)	Percent ORVR Simulation	Average Vent Hydrocarbon Concentration (%C3H8)	Vent Emission Factor (lb/1000gal)	Avg. Fugitive Emission Factor (lb/1000gal)	Average Total Emission Factor (lb/1000gal)	Average VRS Efficiency Loss (%)
9-Sep	Baseline	6942	0	12.1	9.80E-08	0.029	2.89E-02	0.34%
10-Sep	Baseline	6548	0	24.1	1.25E-06	0.022	2.19E-02	0.26%
11-Sep	Baseline	7232	0	37.0	2.77E-08	0.057	5.65E-02	0.67%
12-Sep	Baseline	5239	0	33.6	0.00E+00	0.029	2.91E-02	0.35%
13-Sep	Baseline	5299	0	35.4	2.55E-07	0.002	2.25E-03	0.03%
<b>average</b>		<b>6252</b>	<b>0</b>	<b>28.5</b>	<b>3.26E-07</b>	<b>0.028</b>	<b>2.77E-02</b>	<b>0.33%</b>
14-Sep	<i>Transition</i>	4942	0	30.2	1.42E-08	0.009	9.42E-03	0.11%
15-Sep	ORVR	6183	41.6	14.1	1.62E-08	0.052	5.17E-02	0.62%
16-Sep	ORVR	6200	41.1	19.6	0.00E+00	0.141	1.41E-01	1.68%
17-Sep	ORVR	6171	42.6	13.3	0.00E+00	0.023	2.32E-02	0.28%
18-Sep	ORVR	6851	32.7	12.4	8.76E-09	0.037	3.66E-02	0.44%
<b>average</b>		<b>6351</b>	<b>39.5</b>	<b>14.8</b>	<b>6.23E-09</b>	<b>0.052</b>	<b>5.24E-02</b>	<b>0.75%</b>
19-Sep	<i>Transition</i>	5471	34.6	29.6	3.08E-01	0	3.08E-01	3.67%
20-Sep	ORVR no pv	4718	36.3	28.1	4.58E-01	0	4.58E-01	5.45%
21-Sep	ORVR no pv	6801	41.0	26.0	2.13E-01	0	2.13E-01	2.54%
22-Sep	ORVR no pv	6480	39.2	24.4	3.12E-01	0	3.12E-01	3.72%
23-Sep	ORVR no pv	6236	40.6	22.9	3.23E-01	0	3.23E-01	3.84%
24-Sep	ORVR no pv	7084	37.8	22.5	2.35E-01	0	2.35E-01	2.80%
25-Sep	ORVR no pv	6460	39.2	21.9	2.94E-01	0	2.94E-01	3.50%
26-Sep	ORVR no pv	5547	36.0	21.4	3.06E-01	0	3.06E-01	3.65%
27-Sep	ORVR no pv	4996	35.8	22.7	1.73E-01	0	1.73E-01	2.06%
<b>average</b>		<b>6040</b>	<b>38.2</b>	<b>23.7</b>	<b>2.89E-01</b>	<b>0</b>	<b>2.89E-01</b>	<b>3.44%</b>
28-Sep	<i>Transition</i>	6638	26.9	20.7	2.29E-01	0	2.29E-01	2.72%
29-Sep	<i>Transition</i>	6279	0	21.1	2.59E-01	0	2.59E-01	3.08%
30-Sep	Base no PV	6123	0	4.9	1.47E-02	0	1.47E-02	0.18%
1-Oct	Base no PV	6459	0	4.6	2.20E-02	0	2.20E-02	0.26%
2-Oct	Base no PV	7201	0	4.2	4.03E-02	0	4.03E-02	0.48%
3-Oct	Base no PV	5822	0	1.4	2.64E-03	0	2.64E-03	0.03%
4-Oct	Base no PV	4933	0	2.5	5.98E-02	0	5.98E-02	0.71%
5-Oct	Base no PV	6186	0	1.6	1.65E-02	0	1.65E-02	0.20%
<b>average</b>		<b>6121</b>	<b>0</b>	<b>3.2</b>	<b>2.60E-02</b>	<b>0</b>	<b>2.60E-02</b>	<b>0.31%</b>

average values do not include transition periods

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## 1. INTRODUCTION

Air Resources Board (ARB) Compliance Division (CD) personnel performed field testing to evaluate the interaction between vacuum assist vapor recovery systems (VRS) and onboard refueling vapor recovery (ORVR) equipped vehicles. The tests were designed to determine total hydrocarbon emissions from fugitive sources and the VRS vent riser exhaust during baseline VRS operation and simulated refueling of a vehicle fleet with an ORVR penetration of approximately 40 percent.

Two vacuum assist vapor recovery systems were selected for interaction testing: Gilbarco Vapor Vac and Dresser Industries Wayne Vac. These systems were selected because they combine to represent an estimated 80% of vacuum assist dispensing facilities in California, and account for approximately 55% of the gasoline dispensed statewide. Testing was performed July 29, 1998 through August 10, 1998 at a Vapor Vac system in El Sobrante, California and September 8, 1998 through October 5, 1998 at a Wayne Vac system in Sacramento, California. Each test was divided into two phases: a baseline phase in which the vapor recovery system pressure and vent emissions were monitored during normal operation; and an ORVR simulation phase in which the same parameters were monitored after modifying selected dispensers to simulate ORVR conditions using conventional vehicles.

Previous testing by ARB staff in June and July, 1997 demonstrated that many ORVR systems interact with vacuum assist systems to produce vapor return line hydrocarbon concentrations significantly leaner than those normally present when refueling vehicles equipped with conventional fuel systems. This effect results when particular ORVR systems prevent gasoline vapors from reaching the fill pipe / nozzle interface, forcing the assist system to ingest ambient air in their place. The volume of air returned to the vapor recovery system depends on the operational configuration of both the vapor recovery and ORVR systems. The interaction between lean vapor in the vapor return line and liquid gasoline in the UST produces an increased vapor volume as liquid evaporates into the unsaturated vapor. This increase in volume results in increased fugitive emissions and / or increased emissions from the underground tank vent riser.

## 2. TEST SYSTEMS

### 2.1 Phase I and Phase II Vapor Recovery Systems

Phase I and Phase II vapor recovery systems are installed at California service stations to control hydrocarbon emissions during the delivery and dispensing of gasoline. Phase I vapor recovery controls emissions of gasoline vapors by simultaneously returning UST headspace vapors to the tank truck from which product is being delivered. The vapors transferred to the delivery truck are subsequently returned to a bulk terminal for processing. Phase II vapor recovery systems are designed to capture gasoline vapors displaced from the vehicle fuel tank during refueling and transport these vapors through the nozzle and vapor return lines to the UST. There are two types of Phase II systems currently certified: balance systems and vacuum assist systems.

## 2.2 Balance Vapor Recovery Systems

Balance vapor recovery systems are based on the principle of using dispensed gasoline to displace vapor from the vehicle fuel tank into the vapor recovery path. The vapor path from the vehicle tank to the UST is established using a compressible bellows surrounding the nozzle spout sealed to the vehicle fill pipe by a flexible face plate. Vapor captured in the bellows are returned to the UST via the nozzle body, vapor section of the coaxial hose, and the dispenser and underground vapor return lines.

Because no mechanical device collects vapors from the vehicle and the nozzle is sealed against the fill pipe, little or no air is expected to be ingested when ORVR vehicles are refueled using balance VRS. Testing by the ARB in February, 1996 at a balance VRS in Vacaville, California demonstrated that VRS static pressure during ORVR simulation was equal to or less than the pressures observed during baseline tests.

## 2.3 Vacuum Assist Vapor Recovery Systems

The Gilbarco Vapor Vac and Dresser Wayne Vac vacuum assist systems selected for interaction testing employ a dispenser mounted electric pump to create suction at the nozzle entrance while gasoline is dispensed. The suction transports vapors from the headspace of the vehicle tank to the UST through the fill pipe, nozzle and coaxial hose upstream of the pump and the vapor return piping downstream of the pump. The fundamental difference between the systems is the ratio of vapor captured by the VRS to the volume of product dispensed (A/L ratio). The Gilbarco system is certified for A/L ratios ranging from 1.0 to 1.2, while the Dresser system is certified for A/L ratios from 0.9 to 1.1. Both systems are equipped with a pressure / vacuum (P/V) valve mounted at the exhaust of the UST vent riser to assist in controlling phase I and phase II emissions by maintaining system pressure within a range of plus 3.0 inches water column ("WC) to minus 8.0 "WC.

In addition to the vacuum assist systems tested, other assist systems (e.g. Hasstech, Hirt) utilize a vacuum pump sized to collect a volume of vapor much greater than the volume of product dispensed. The vapor volumes produced by these high A/L systems require addition of a vapor processor to the vapor recovery system to prevent excessive emissions from the P/V valve. The processor consists of a thermal oxidation device activated when the UST or vapor return line pressure reaches a designated amount.

## 2.4 Onboard Refueling Vapor Recovery (ORVR)

Onboard Refueling Vapor Recovery (ORVR) was promulgated by USEPA in 1994 as an alternative to Phase II vapor recovery systems. In contrast to Phase II systems, ORVR systems create a seal in the vehicle fill pipe during dispensing to route vapors normally displaced through the fill pipe to an onboard canister containing activated charcoal. During normal driving, the ORVR system uses engine manifold vacuum to desorb the vapors from the charcoal and meter them to the intake of the engine fuel system.

There are currently two fundamental methods of creating a fill pipe seal in ORVR systems: dynamic and mechanical. The dynamic, also called liquid, seal is created by configuring the fill pipe so that dispensed gasoline is entrained in the fill pipe, creating the necessary pressure in the fuel tank headspace to force vapors to the onboard canister.

The fill pipe in a mechanical seal system contains an o-ring or other physical seal which fits snugly around the nozzle spout when inserted in the fill pipe. The seal prevents headspace vapor from escaping the nozzle / fill pipe interface as product is dispensed. When refueling mechanical seal ORVR systems, the vapor return path hydrocarbon concentration and vapor volume displaced to the onboard canister can vary greatly from dynamic systems, depending on the configuration particular to each system.

### 3. SAMPLING METHODOLOGY AND SAMPLING LOCATIONS

Emissions of total hydrocarbons were determined using equipment and procedures contained in the ARB Certification and Test Procedures for Gasoline Dispensing Facilities. The following sections describe the target parameters and test methodology used to determine hydrocarbon emissions at each of the selected sampling locations.

#### 3.1 Mass Flow / Mass Emissions at the UST Vent Riser and P/V Valve Exhaust

Total hydrocarbon mass flow rates were determined in the UST vent riser using ARB TP-201.2 – “*Determination of Efficiency of Phase II Vapor Recovery Systems of Dispensing Facilities.*” However, TP-201.2 can not quantitate vent riser emissions due to allowable leakage through the P/V valve if the leak rate is below the starting threshold of the specified flow meter. Therefore, the test procedure was modified to include sample locations both upstream and downstream of the P/V valve mounted at the UST vent riser exhaust. Sample locations and parameters are shown in Figure 3-1.

TP-201.2 also incorporates methods for determining mass flow at the nozzle / fill pipe interface and underground vapor return line; however, these two locations were outside the scope of this test and omitted. The omitted sampling locations serve in determining emissions at the vehicle fill pipe and overall VRS efficiency, whereas the scope of this test focused on determining VRS fugitive and vent riser emissions.

##### 3.1.1 Upstream (Reference) Sample Location

During testing with the Gilbarco system, vapor recovery system pressure, temperature and volumetric flow rate were determined at a location approximately two feet upstream of the P/V valve. This is the sample location incorporated by reference in TP-201.2. Total hydrocarbon concentrations (as propane) were determined in the vent riser approximately five feet above ground level and at ground level in the dispenser riser and Phase I vapor recovery drop tube by integrated grab samples using summa polished canisters and USEPA Method 18 – “*Measurement of Gaseous Organic Compound Emissions by Gas Chromatography*”, instead of the continuous gas analyzer specified in TP-201.2.

Method 18 sample apparatus consisted of a stainless steel or Teflon sample line, flow meter and a six liter summa polished stainless steel canister connected in series. All summa canisters were supplied by the BAAQMD and evacuated to a vacuum of approximately 29.9 inches mercury prior to sampling. Method 18 samples were collected at a rate of approximately 0.04 lpm by relieving the vacuum in the cylinder.

During testing with the Wayne system, system pressure and temperature were determined just below the roots meter. Total hydrocarbon concentration was continuously monitored

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in the UST vent riser at ground level to more accurately reflect system conditions in the UST vent manifold. Hydrocarbon concentrations were determined using a non-dispersive infrared (NDIR) continuous gas analyzer as specified in TP-201.2. The NDIR analyzer employs a non-destructive sample chamber allowing return of the gas sample to its collection point. Grab sampling with summa canisters was also performed at the Phase I vapor return tube on the 87 octane tank. The samples were analyzed by BAAQMD using EPA Method 18 discussed above.

### 3.1.2 Downstream (P/V Valve Exhaust) Sample Location

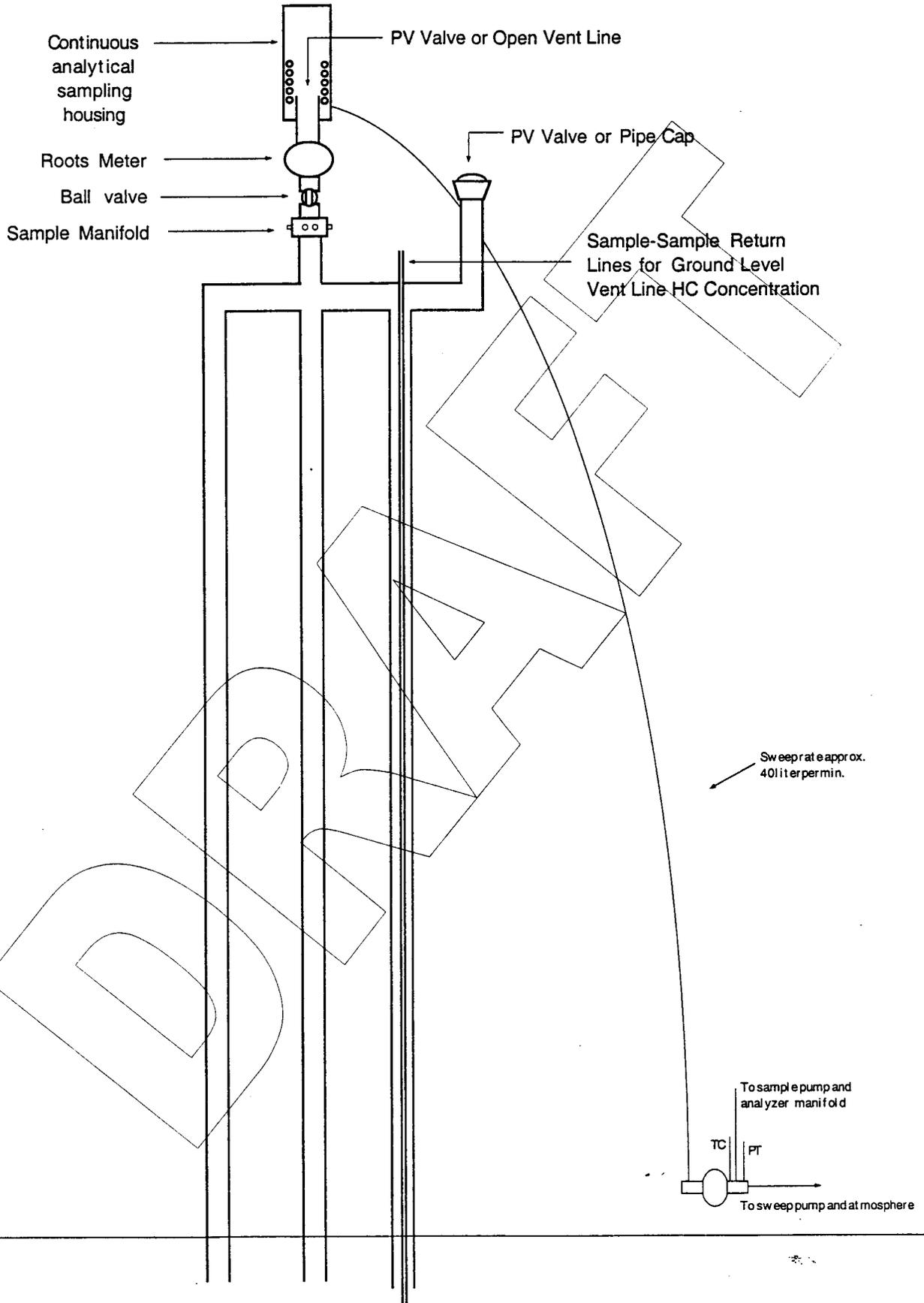
As previously stated, the current version of TP-201.2 cannot measure vapor leaks through the P/V valve that are below the starting threshold the ROOTS<sup>®</sup> meter used to determine volumetric flow rate. The starting threshold for the 0-3000 cubic feet per hour meter used at the upstream location is approximately 3.0 cfh, compared to the allowable P/V valve leak rate of 0.38 cfh. A Husky Model 4620 P/V valve was used during testing at both the Vapor Vac and Wayne Vac test facilities. This valve (SN 122980) was leak tested in the CD shop July 13, 1998 where its leak rate was measured as 0.01 cfh at a pressure of 2.5 inches WC.

The discrepancy between the allowable leak rate and starting threshold accentuated the need to determine mass emissions due to allowable, yet undetected leakage at the P/V valve. This was accomplished by enclosing the P/V valve using a Continuous Analyzer Sampling Housing (CASH), also shown in Figure 3-1. The CASH is a twenty-four inch long cylinder, constructed of eight-inch inside diameter (ID), Schedule 20 PVC pipe with removable caps at both openings. A two-inch diameter hole in one cap allowed the CASH to be installed on the UST vent riser with the P/V valve removed. The P/V valve was then reinstalled and the remaining cap sealed the top opening. Four, one-inch diameter openings, located 90 degrees apart on the upper cylinder circumference, allow sweep air to enter the CASH.

Sweep air was drawn into the CASH through a spiral sample probe constructed of ten, six-inch diameter coils of perforated 3/8" ID copper tubing. The CASH was installed on the vent riser in a manner such that the spiral probe encircled the full height of the P/V valve. A 3/8" ID Teflon sample line delivered sample gas from the probe to a roots meter, sample pump and NDIR hydrocarbon analyzer connected in series.

Prior to field testing, validation tests of the CASH were performed at the Compliance Division shop. Using a sweep air rate of 36 liters per minute and 30.4% propane flowing at 0.0152 lpm, the CASH demonstrated the ability to quantify a total hydrocarbon emission rate of  $1.14 \times 10^{-3}$  lb/hr within  $96.7 \pm 0.15\%$ . For comparison, an emission rate of  $1.17 \times 10^{-3}$  lb/hr represents a 0.10% efficiency decrease at a facility dispensing 100,000 gallons per month, assuming an uncontrolled hydrocarbon emission factor of 8.4 pounds per thousand gallons dispensed.

**FIGURE 3-1**  
**Sampling Locations and Parameters and**  
**Continuous Analyzer Sampling Housing (CASH)**



### 3.2 Fugitive Emissions

Fugitive emissions were calculated for each phase of baseline and ORVR simulation testing by combining vapor recovery system hydrocarbon concentrations with a pressure versus flow curve developed from pressure decay testing of the test station at the conclusion of each test phase. VRS hydrocarbon concentrations were determined using a combination of grab samples and continuous analyzer data collected at the vent riser, vapor return manifold and UST headspace.

Grab samples were collected in summa polished canisters according to USEPA Method 18 by inserting a Teflon sample probe into a threaded fitting at the desired sample location. Each grab sample was collected at a rate of approximately 0.04 lpm for two hours to minimize disruption of the vapor recovery system.

For grab samples in the UST headspace, the fitting was attached to the cap atop the UST Phase I vapor return tube. A plunger mounted to the underside of the cap held the vapor poppet valve in the open position, allowing vapor from the UST headspace to enter the sample system.

Pressure decay data for use in fugitive emission calculations were generated using ARB TP-201.3 *“Determination of 2 Inch (WC) Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities.”* At the conclusion of each test phase, a plot of leak rate versus average system pressure was generated by performing TP-201.3 at a pressure representative of the maximum VRS pressure generated during testing and two intermediate pressures. An average fugitive leak rate was calculated for the VRS for each hour of testing using the leak rate versus pressure curve and the hourly average VRS pressure. The product of the fugitive leak rate and the UST headspace hydrocarbon concentration yields an estimate of fugitive emissions from the VRS.

### 3.3 Pre and Post Test Vapor Recovery System Performance Tests

#### 3.3.1 Air to Liquid Ratio (A/L) Tests

To ensure system performance within the certification range established by ARB, A/L ratios were determined using ARB TP-201.5 prior to, and at the conclusion of testing at each test facility. Testing was not initiated at either facility until all its nozzles obtained an A/L ratio within the range specified in the respective Executive Order.

#### 3.3.2 Static Pressure Decay Testing

VRS static pressure testing was performed using ARB TP-201.3 prior to baseline and ORVR simulation testing at each facility. If the particular VRS did not pass the pre-test static pressure test, the system was serviced and the test repeated until the system pressure decay rate was within the limits of TP-201.3. Pressure decay testing was again performed at the completion of each test phase to establish the fugitive leak rate versus VRS pressure curve discussed in Section 3.2. After generating the leak versus VRS pressure curve, the system was serviced and pressure tested as necessary to meet TP-201.3 requirements.

#### 4. ANALYTICAL INSTRUMENTS AND DATA ACQUISITION

This section identifies and describes the analytical instruments used to determine hydrocarbon mass emission rates at the vent riser exhaust. Sampling locations sample parameters, instrument range and detection methods are summarized in Table 4.1.

All sampling parameters were recorded at one-second intervals using an Easterline Angus Video Graphic Recorder data acquisition system. The data acquisition system was programmed to report instantaneous and cumulative mass emission rates at the UST vent riser and P/V valve exhaust. A program subroutine continuously compared the emission rates at each location before reporting the greater of the two rates to the emission rate totalizer. This prevented over reporting emissions in the event the volumetric flow through the P/V valve was above the starting threshold of the Roots meter installed in the UST vent riser. As it turned out, the in-line roots meter was never used to quantify vent line emissions.

##### 4.1 Total Hydrocarbon Concentration

Total hydrocarbon concentrations (as propane) were continuously measured at the P/V valve exhaust and in the UST vent riser. A Beckman Model 400 continuous gas analyzer equipped with a flame ionization detector measured total hydrocarbon concentrations in the range of 0-400 ppmv as propane at the P/V valve exhaust. Hydrocarbon concentrations in the range of 0-5000 ppmv and 0-50000 ppmv at the P/V exhaust were measured by an Optical Filter Corporation (OFC) Model IR-703 continuous gas analyzer using non-dispersive infrared detection. An OFC Model IR-703 also measured total hydrocarbon concentrations in the range of 0-100% (as propane) in UST vent riser at the Wayne Vac test facility. The OFC analyzer was selected for use at the vent riser sample location for its non-destructive detection method. This feature allows for sample gas exiting the analyzer to return to the collection point, minimizing disturbances to the system. The millivolt outputs from the analyzers were recorded on both a strip chart and the data acquisition system.

##### 4.2 Volumetric Flow Rate

The volumetric flow rate of vapor in the UST vent riser and sweep air at the P/V valve exhaust was measured using a Dresser Industries Model 3M175 Roots meter. The two Model 3M175 meters used for this test are calibrated for flow ranging from 0 – 50 cubic feet per minute (0-3000 cfh) and equipped with digital pulse generators for integration with the data acquisition system.

##### 4.3 Pressure and Temperature

Differential pressure in the UST vent riser and P/V valve sweep air were determined using Omega Model DP-41E pressure transducers and controllers. Atmospheric pressure was determined using an Atmospheric Instrumentation Research (AIR) Model AB-2A pressure transducer. All pressure measurements were recorded by the data acquisition system; however, only differential pressure in the UST was recorded by strip chart.

Temperature in the UST vent riser and P/V valve sweep air was measured using type K thermocouples and recorded using the data acquisition system.

<b>Table 4-1 Sample Parameters and Instrumentation</b>				
<b>Parameter</b>	<b>Location</b>	<b>Instrument</b>	<b>Detection</b>	<b>Range of Values Measured</b>
Hydrocarbon Concentration (as propane)	P/V Exhaust	Beckman 400	FID	0-400 ppmv
	P/V Exhaust	OFC IR-703	NDIR	0-5000 ppmv
	P/V Exhaust	OFC IR-703	NDIR	0-50000 ppmv
	UST Riser	OFC IR-703	NDIR	0 - 100 %
Flow Rate	P/V Exhaust	Dresser 3M175	Positive Displacement	0 – 50 acfm
	UST Riser	Dresser 3M175		
Pressure	P/V Exhaust	Omega DP-41E	Transducer	0-20 “WC
	UST Riser	Omega DP-41E		0-20 “WC
	Ambient	Omega DP-41E		23.6-32.8 “Hg
Temperature	P/V Exhaust	Type K	Thermocouple	0 – 200 F
	UST Riser	Type K		

## 5. ORVR SIMULATION MODIFICATIONS

At the conclusion of each baseline test period, the VRS was configured to simulate refueling a vehicle fleet having an ORVR penetration level of approximately 40%. This was achieved by modifying selected dispensers to ingest air to the UST vapor return line during product dispensing. However, defeating VRS components in this manner produces two adverse test conditions: 1) during dispensing, vapors in fuel tank headspace are displaced to atmosphere instead of the VRS; and 2) the effect of ORVR vehicles on the VRS may be over estimated. Prior testing by ARB demonstrated that most liquid seal ORVR systems return a vapor mixture containing 2%- 13% hydrocarbons to the VRS. Conversely, mechanical seal ORVR systems create a physical barrier between the vapor in the vehicle fuel tank and its surroundings, allowing the system to interact with vacuum assist vapor recovery systems in a manner similar to conventional vehicles (i.e. vapor concentrations returned to the VRS are similar to non-ORVR vehicles, 15% – 45%).

Since each VRS tested differ in engineering philosophy, the ORVR modifications applied to each VRS were specific to the configuration and performance of the individual systems. The following sections describe the specific hardware modifications made to each system for ORVR simulation.

### 5.1 Gilbarco Vapor Vac

Gilbarco Vapor Vac test dispensers were modified by disconnecting the electrical lead to the solenoid operated vapor valve of each product nozzle selected for ORVR simulation. Disconnecting this lead isolates the vapor return path of the dispensed product from the vehicle fuel tank, displacing the headspace vapors to atmosphere as product is dispensed. The lead from the disabled vapor path was reconnected to an adjoining vapor valve, allowing ambient air into the vapor return path of an adjacent, idle nozzle while product is dispensed from the selected nozzle. This modification allows for ORVR simulation

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using conventional vehicles while maintaining the A/L ratio determined for the test dispenser. The dispensers modified for ORVR simulation testing at the Vapor Vac facility in El Sobrante are identified in Table 5-1.

**5.2 Dresser Industries Wayne Vac System**

Wayne Vac test dispensers were modified for ORVR simulation by installing an electrically actuated solenoid valve at the inlet to the vapor pump in the vapor return path at the base of the dispenser. In addition, the vapor path from the nozzle, coaxial hose and dispenser piping was disconnected from the vapor pump and capped so that no vapor was drawn through the modified nozzle. The solenoid and the fast flow valve in the dispenser were wired to share voltage from the dispenser flow control coil. This wiring configuration allowed both valves to simultaneously open only when product was dispensed, with ambient air entering the vapor return line through the open solenoid. This configuration also prevented the system from ingesting fresh air between the time the dispenser was activated and product was actually dispensed. A needle valve at the solenoid entrance was adjusted so that the vapor pump inlet pressure when ingesting air through the solenoid and needle valve was equal to the pump inlet pressure when ingesting vapors through the nozzle as measured during A/L testing of the selected nozzle. The dispensers modified for ORVR simulation testing at the Wayne Vac facility in Sacramento are identified in Table 5-2.

<b>TABLE 5-1</b>	
<b>Gilbarco Vapor Vac Dispensers Modified for ORVR Simulation</b>	
<b>Dispenser Number</b>	<b>Dispensing Nozzles</b>
1	87 and 92 Octane
3	87 and 92 Octane
4	87 and 92 Octane
5	87 and 92 Octane

<b>TABLE 5-2</b>	
<b>Dresser Industries Wayne Vac Dispensers Modified for ORVR Simulation</b>	
<b>Dispenser Number</b>	<b>Dispensing Nozzle</b>
2	87 Octane
4	87 Octane
6	87 Octane
8	87 Octane

## 6. TEST RESULTS

The following sections present and summarize the results of baseline and ORVR simulation testing at the Gilbarco Vapor Vac and Dresser Industries Wayne Vac facilities, respectively.

As described in Section 3, the fugitive emissions data presented herein were generated using a combination of grab sample, continuous analyzer and VRS pressure decay data. Although comprehensive, the hydrocarbon concentration data used in fugitive emission calculations may not represent the spatial variation throughout the VRS and temporal variations occurring during the period when no grab samples were collected. Therefore, fugitive emission factors are reported as a “high” value, based on the highest observed hydrocarbon concentration and a “low” value, based on the lowest hydrocarbon concentration observed during the monitoring period. The high and low fugitive emission factors are combined with the vent emission factor to produce a range of total emission factors and system efficiency loss within the bracket of high and low values presented.

### 6.1 Gilbarco Vapor Vac System

#### 6.1.1 Baseline Testing

Baseline testing was performed at the Vapor Vac facility between July 29, 1998 and August 3, 1998. The average daily range of hydrocarbon concentrations, fugitive emission factors, total emission factors and efficiency loss are presented in Table 6.1-1. Hourly VRS pressure and vent emission data used to generate the daily averages are presented in Table 6.1-5 through Table 6.1-9A. Analytical results for the grab samples used to determine VRS concentration are presented in Table 6.1-3. The VRS pressure decay curve used to determine fugitive leak rates and emissions is presented as Figure 6.1-1. Figure 6.1-1 was developed from two separate pressure decay tests: a 2 inch test performed 8/4/98 and a 3.5 inch test performed 8/10/98.

Table 6.1-1 reports the daily maximum and minimum total emission factors during baseline testing as 0.584 pounds per thousand gallons dispensed (lb /1000 gal) for 7/29/98 through 7/30/98 to 0.195 lb/ 1000 gal for 8/1/98 through 8/2/98. The maximum and minimum system efficiency loss corresponding to these emission factors are 6.95% and 2.32%, respectively. The average total emission factor for the baseline test period ranged from 0.434 lb / 1000 gal to 0.356 lb / 1000 gal with corresponding efficiency losses ranging from 5.17% to 4.25%.

Examination of Table 6.1-1 shows that baseline emissions determined at the Vapor Vac facility consisted almost entirely of fugitive emissions, as the emission factors determined at the P/V valve exhaust during the baseline test ranged from 5.56 E-4 lb / 1000 gal to 1.21 E-5 lb / 1000 gal.

### 6.1.2 ORVR Simulation Testing

The percent of ORVR penetration simulated with the Vapor Vac VRS ranged from a low of 42.5% to a maximum of 48.8%. The average for the simulation phase was 44.9%.

The average daily range of concentrations, fugitive emission factors, and VRS efficiency loss determined during the post baseline transition period and ORVR simulation are presented in Table 6.1-2. ORVR simulation testing was performed at the Vapor Vac facility August 4, 1998 through August 9, 1998. The transition period coincides with the start of dispenser conversions on August 3, 1998 through the beginning of ORVR simulation testing on August 4, 1998. Hourly VRS pressure and vent emission data used to generate the daily averages are presented in Table 6.1-10 through Table 6.1-14A. Analytical results for the grab samples used to determine VRS concentration during ORVR simulation are presented in Table 6.1-4. The VRS pressure decay curve used to determine fugitive leak rates and emissions during ORVR simulation is the same curve presented in Figure 6.1-1.

During baseline testing and the first half of ORVR simulation, grab samples to determine vapor return hydrocarbon concentration were collected in the vapor return line at the base of dispenser 4. However, modification of this dispenser for ORVR simulation resulted in a sample location compromised by its proximity to the source of ingested air, which could introduce a negative bias to hydrocarbon concentrations measured at that point. Therefore, the sample location was switched to the Phase I drop tube for the remainder of testing.

Table 6.1-2 reports daily maximum and minimum fugitive emission factors during ORVR simulation of 1.14 lb / 1000 gal and 0.333 lb / 1000 gal with corresponding vent emission factors of 0.222 lb / 1000 gal and 0.000245 lb / 1000 gal. The daily maximum and minimum total emission factors determined during ORVR simulation were 1.34 lb / 1000 gal and 0.334 lb / 1000 gal, respectively, which correspond to system efficiency losses of 16.0% and 3.97%. The average total emission factor for the entire ORVR simulation period ranged from 0.942 lb / 1000 gal to 0.621 lb / 1000 gal with corresponding efficiency losses ranging from 11.2% to 7.39%. However, excluding the first day (8/04/98 – 8/05/98) of ORVR simulation data from the average values yields average emission factors ranging from 1.05 lb / 1000 gal to 0.693 lb / 1000 gal and efficiency losses between 12.5% and 8.25%.

Although the average emission factor determined at the P/V valve exhaust during ORVR simulation is approximately 500 times greater than the baseline average, the resulting decrease in VRS efficiency is still less than 2% of controlled emissions. The average fugitive emissions determined during ORVR simulation were approximately double the baseline average and accounted for the majority of the decrease in system efficiency.

The increase in fugitive and P/V valve emissions determined during ORVR simulation testing are consistent with the increased VRS pressures monitored during the ORVR phase. Average daily VRS pressures determined during baseline testing ranged between 1.20 “WC and 2.01 “WC with a baseline average of 1.48 “WC. Average daily VRS pressures determined during ORVR simulation ranged between 2.07 “WC and 3.00 “WC with an overall average of 2.74 “WC, an 85% increase from baseline.

## 6.2 Dresser Industries Wayne Vac System

Two significant modifications were made to the test protocol prior to initiating testing at the Wayne Vac facility in Sacramento. The first modification was to the method of total hydrocarbon measurement in the base of the UST vent riser. The vent riser was configured to determine hydrocarbon concentration using a NDIR continuous gas analyzer, allowing the sample gas exiting the analyzer to return to its point of origin, instead of the summa canister grab samples collected from the Vapor Vac system. This modification provided continuous hydrocarbon concentration data for use in fugitive emission calculations. Whereas grab samples provide average concentration for a finite time period, requiring an assumption of no temporal concentration variations during the period between samples.

The second modification focused on elimination of the fugitive emissions calculation and its inherent assumptions while still determining total VRS emissions. To accomplish this objective, additional testing was performed with the P/V valve removed from the system allowing system emissions measurement at a single point at the vent riser exhaust. To accommodate the additional tests, testing at the Wayne Vac facility was divided into four phases: 1) baseline, 2) ORVR simulation, 3) ORVR simulation minus P/V valve and 4) baseline minus P/V valve.

### 6.2.1 Wayne Vac Baseline Testing, P/V Valve Installed

Baseline testing was performed with the P/V valve installed at the Wayne Vac facility between September 8, 1998 and September 13, 1998. The average daily range of hydrocarbon concentrations, fugitive emission factors, total emission factors and efficiency loss are presented in Table 6.2-1. Hourly VRS pressure and vent emission data used to generate the daily averages are presented in Table 6.2-9 through Table 6.2-13A. Analytical results for the grab samples used to determine VRS concentration are presented in Table 6.2-5. The VRS pressure decay curve used to determine fugitive leak rates and emissions is presented as Figure 6.2.1.

The data in Table 6.2-1 shows fugitive emissions account for all baseline emission factors determined at the Wayne Vac facility, as the baseline emission factors determined at the P/V valve exhaust were insignificant when comparing fugitive emissions to total emissions.

Table 6.2-1 reports maximum and minimum fugitive emission factors during baseline testing as 0.0885 lb /1000 gal (9/10/98 through 9/11/98) and 0.000584 lb/ 1000 gal (9/12/98 through 9/13/98). These emission factors represent system efficiency losses ranging of 1.05% and 0.007%. The average total emission factor for the baseline test period ranged between 0.0407 lb / 1000 gal to 0.0148 lb / 1000 gal with corresponding range of efficiency loss from 0.48% to 0.16%.

### 6.2.2 Wayne Vac ORVR Simulation, P/V Valve Installed

The percent of ORVR penetration simulated for the Wayne Vac VRS with P/V valve ranged from a low of 32.7% to a maximum of 42.6%. The average for the simulation phase was 39.5%.

The average daily range of concentrations, fugitive emission factors, and VRS efficiency loss determined during the post baseline transition period and ORVR simulation with the P/V valve installed are presented in Table 6.2-2. ORVR simulation testing was performed at the Wayne Vac facility September 14, 1998 through September 18, 1998. The transition period coincides with the start of dispenser conversions on September 13, 1998 until ORVR simulation testing began September 14, 1998. Hourly VRS pressure and vent emission data used to generate the daily averages are presented in Table 6.2-14 through Table 6.2-18A. Analytical results for the grab samples used to determine VRS concentration are presented in Table 6.1-6. The VRS pressure decay curve used to determine fugitive leak rates and emissions during ORVR simulation is presented as Figure 6.2.2.

Table 6.2-2 reports daily maximum and minimum fugitive emission factors during ORVR simulation as 0.186 lb / 1000 gal and 0.0198 lb / 1000 gal. The resultant VRS efficiency losses are 2.22% and 0.24%, respectively. The average total emission factor for the ORVR simulation period ranged from 0.0798 lb / 1000 gal to 0.0465 lb / 1000 gal with corresponding efficiency losses between 0.95% and 0.55%.

As was the case during baseline testing, fugitive emissions calculations account for all emissions reported during ORVR simulation at the Wayne Vac facility with the P/V valve installed. The increase in VRS pressure during the ORVR simulation phase was not sufficient to cause quantifiable mass flow at the P/V valve exhaust.

### 6.2.3 Wayne Vac ORVR Simulation Minus P/V Valve

The percent of ORVR penetration simulated for the Wayne Vac VRS without the P/V valve ranged from a low of 35.8% to a maximum of 41.0%. The average for the simulation phase was 38.2%.

The daily average range of concentrations, total emission factors, and VRS efficiency loss determined after removing the P/V valve from the VRS and continuing ORVR simulation testing are presented in Table 6.2-3. ORVR simulation testing without the P/V valve was performed at the Wayne Vac facility September 19, 1998 through September 27, 1998. The transition period coincides with P/V valve removal on September 18, 1998 until ORVR simulation testing resumed September 19, 1998. Hourly VRS pressure and vent emission data used to generate the daily averages are presented in Table 6.2-19 through Table 6.2-27. Analytical results for the grab samples used to determine VRS concentration are presented in Table 6.2-7.

Table 6.2-3 shows the maximum and minimum daily emission factors determined at the vent riser exhaust without the P/V valve were 0.458 lb / 1000 gal and 0.173 lb / 1000 gal. The resultant VRS efficiency losses are 5.45% and 2.06%, respectively.

#### 6.2.4 Wayne Vac Baseline Testing Minus P/V Valve

Average daily concentrations, total emission factors, and VRS efficiency loss determined after returning the test dispensers to their original configuration and continuing testing in the baseline mode with the P/V valve removed are presented in Table 6.2-4. Baseline testing without the P/V valve was performed at the Wayne Vac facility September 29, 1998 through October 5, 1998. The transition period coincides with dispenser reconfiguration on September 28, 1998 through resumption of baseline testing on September 29, 1998. Hourly VRS pressure and vent emission data used to generate the daily averages are presented in Table 6.2-28 through Table 6.2-35. Analytical results for the grab samples used to determine VRS concentration are presented in Table 6.2-8.

Table 6.2-4 shows the maximum and minimum daily emission factors determined at the vent riser exhaust during baseline tests without the P/V valve were 0.0598 lb / 1000 gal and 0.00264 lb / 1000 gal. The resultant VRS efficiency losses are 0.71% and 0.031%, respectively.

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**TABLE 6.1-1**  
**Baseline Emissions Data Summary,**  
**Gilbarco Vapor Vac, El Sobrante, CA**

Date	Test Mode	Product Dispensed (gallons)	Avg. Hydrocarbon Concentration (% as Propane)		Individual Emission Factors (lb / 1000 gal)			Total Emission Factor Range (lb / 1000 gal)		Efficiency Loss (percent)		Data Qualifier
			High	Low	Fugitive		Vent	High	Low	High	Low	
					High	Low						
Jul 29-30	Baseline	4138	41.3 C	38.7 C	0.584	0.549	5.56E-4	0.584	5.50	6.95	6.54	
Jul 30-31	Baseline	4198	34.0 V	26.0 D	0.572	0.437	1.21E-5	0.572	0.437	6.81	5.21	
7/30-8/1	Baseline	5076	36.1 D	29.6 V	0.401	0.311	5.14E-5	0.401	0.311	4.77	3.70	
Aug 1-2	Baseline	4307	33.7 V	22.7 D	0.289	0.194	2.72E-4	0.289	0.195	3.44	2.32	
Aug 2-3	Baseline	4063	39.1 C	35.4 C	0.326	0.291	3.13E-4	0.326	0.292	3.88	3.48	
<b>Average</b>	<b>Baseline</b>	<b>4356</b>	<b>36.8</b>	<b>30.5</b>	<b>0.434</b>	<b>0.356</b>	<b>2.41E-4</b>	<b>0.434</b>	<b>0.356</b>	<b>5.17</b>	<b>4.25</b>	

NOTE:

- V - Hydrocarbon concentration determined at vent riser by summa canister.
- D - Hydrocarbon concentration determined at dispenser “stub up” by summa canister.
- U - Hydrocarbon concentration determined at phase 1 vapor cap by summa canister.
- C - Hydrocarbon concentration determined using combined summa data from vent and dispenser or phase 1 vapor cap.

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**TABLE 6.1-2  
ORVR Simulation Data Summary,  
Gilbarco Vapor Vac, El Sobrante, CA**

Date	Test Mode	Product Dispensed (gallons)	Avg. Hydrocarbon Concentration (% as Propane) High   Low		Individual Emission Factors (lb / 1000 gal)			Total Emission Factors (lb / 1000 gal) High   Low		Efficiency Loss (percent) High   Low		ORVR Dispensed (%)
					Fugitive		Vent					
					High	Low						
Aug 3-4	Trans.	3646	40.1 D	39.6 V	0.212	0.209	2.85E-4	0.212	0.209	2.52	2.49	NA
Aug 4-5	ORVR	4381	29.1 C	19.3 C	0.502	0.333	2.45E-4	0.503	0.334	5.98	3.97	42.5
Aug 5-6	ORVR	4364	28.9 D	16.3 V	0.801	0.452	4.46E-2	0.845	0.496	10.1	5.91	44.7
Aug 6-7	ORVR	4355	30.5 C	17.9 C	0.892	0.521	0.101	0.993	0.622	11.8	7.41	44.6
Aug 7-8	ORVR	4061	35.3 U	22.5 V	1.14	0.726	0.204	1.34	0.930	16.0	11.1	48.8
Aug 8-9	ORVR	4017	26.6 C	16.5 C	0.809	0.502	0.222	1.03	0.724	12.3	8.62	44.0
<b>Average</b>	<b>ORVR</b>	<b>4236</b>	<b>30.1</b>	<b>18.5</b>	<b>0.829</b>	<b>0.507</b>	<b>0.114</b>	<b>0.942</b>	<b>0.621</b>	<b>11.2</b>	<b>7.39</b>	<b>44.9</b>
<b>Avg. minus Aug 4-5</b>		<b>4199</b>	<b>30.3</b>	<b>18.3</b>	<b>0.911</b>	<b>0.555</b>	<b>0.143</b>	<b>1.05</b>	<b>0.693</b>	<b>12.5</b>	<b>8.25</b>	<b>45.5</b>

NOTE:

- V - Hydrocarbon concentration determined at vent riser by summa canister.
  - D - Hydrocarbon concentration determined at dispenser “stub up” by summa canister.
  - U - Hydrocarbon concentration determined at phase 1 vapor cap by summa canister.
  - C - Hydrocarbon concentration determined using combined summa data from vent and dispenser or phase 1.
- Average data does not include Aug 3 – 4 Transition period.

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**TABLE 6.1-3  
Summa Canister Grab Sample Results  
Baseline Test, Gilbarco Vapor Vac, El Sobrante**

DATE	SAMPLE ID	TIME		LOCATION	HYDROCARBONS (% PROPANE)
		START	STOP		
July 29, 1998	98-0341	1430	1630	Vent Riser	42.1 %
July 29, 1998	98-0342	1635	1830	Dispenser Vapor Return	43.2 %
July 30, 1998	98-0344	0905	1005	Vent Riser	34.0 %
July 30, 1998	98-0343	0900	1030	Dispenser Vapor Return	26.0 %
July 31, 1998	98-0353	1945	2120	Vent Riser	38.3 %
July 31, 1998	98-0352	2000	2120	Dispenser Vapor Return	34.5 %
August 1, 1998	98-0350	0900	1100	Vent Riser	33.7 %
August 1, 1998	98-0351	0900	1100	Dispenser Vapor Return	22.7 %
August 2, 1998	98-0354	2000	2140	Vent Riser	41.6 %
August 2, 1998	98-0355	2000	2100	Dispenser Vapor Return	39.6 %
August 3, 1998	98-0356	0500	0800	Vent Riser	39.6 %
August 3, 1998	98-0357	0630	0830	Dispenser Vapor Return	40.1 %

**TABLE 6.1-4**  
**Summa Canister Grab Sample Results**  
**ORVR Simulation, Gilbarco Vapor Vac, El Sobrante**

DATE	SAMPLE ID	TIME		LOCATION	HYDROCARBONS (% PROPANE)
		START	STOP		
August 4, 1998	98-0363	1815	2045	Vent Riser	26.2 %
August 4, 1998	98-0364	1830	2030	Dispenser Vapor Return	14.9 %
August 5, 1998	98-0365	0830	1030	Vent Riser	16.3 %
August 5, 1998	98-0366	0830	1000	Dispenser Vapor Return	28.9 %
August 6, 1998	98-0362	2000	2200	Vent Riser	23.2 %
August 7, 1998	98-0378	0810	0945	Vent Riser	22.5 %
August 7, 1998	98-0377	0810	0945	Phase I Drop Tube	35.3 %
August 8, 1998	98-0381	2050	2250	Vent Riser	23.0 %
August 8, 1998	98-0382	2050	2250	Phase I Drop Tube	14.0 %

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TABLE 6.1-5  
Vapor Vac Baseline Test July 29, 1998 1400 hrs to July 30, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure (" Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	2.79	29.94	0.25203	
1500-1600	2.86	29.92	0.18046	
1600-1700	2.92	29.91	0.10346	In Calibration 1630-1700 hrs, Max Pressure
1700-1800	2.71	29.9	0.1713	
1800-1900	2.49	29.89	0.14286	
1900-2000	2.62	29.89	0.15849	
2000-2100	2.3	29.89	0.07317	
2100-2200	2.11	29.9	0.17419	In Calibration 2100-2120 hrs, Hourly Mass estimated from Total mass from 2120 to 0520
2200-2300	1.89	29.9	0.26128	Hourly Mass estimated from Total mass from 2120 to 0520
2300-2400	1.84	29.89	0.26128	Hourly Mass estimated from Total mass from 2120 to 0520
0000-0100	1.72	29.88	0.26128	Hourly Mass estimated from Total mass from 2120 to 0520
0100-0200	1.58	29.87	0.26128	Hourly Mass estimated from Total mass from 2120 to 0520
0200-0300	-3.28	29.86	0	Bulk Drop at 0215, Pi=+1.40, Pf=-7.30
0300-0400	-3.79	29.87	0	Min Pressure
0400-0500	-1.68	29.88	0	
0500-0600	-0.84	29.89	0	In Calibration 0520-0600 hrs
0600-0700	0.37	29.89	0	
0700-0800	0.82	29.9	0	
0800-0900	1.3	29.91	0	
0900-1000	1.48	29.91	0	Start Summa 0900
1000-1100	1.62	29.92	0	Stop Summa 11100
1100-1200	1.73	29.93	0	
1200-1300	1.8	29.93	0	
1300-1400	1.85	29.93	0.00006	
24 hr average	1.22	29.90		

24 Hour Vent Emission Mass (lbs)	0.00230	
24 Hour Product Throughput (gal)	4138	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	2.4156	2.2737
Emission Factor (lb/1000 gal)	0.5843	0.5500
System Efficiency Loss (%)	6.96%	6.55%

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

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TABLE 6.1-5A

Gilbarco Vapor Vac, 7/29/98 to 7/30/98					
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)	Low Fugitive Conc (% C3H8)	High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
1400-1500	0.07082	43.2 D	42.1 V	0.20978	0.20444
1500-1600	0.07371	43.2 D	42.1 V	0.21834	0.21278
1600-1630	0.07622	43.2 D	42.1 V	0.22580	0.22005
1700-1800	0.06758	43.2 D	42.1 V	0.20020	0.19511
1800-1900	0.05906	43.2 D	42.1 V	0.17495	0.17049
1900-2000	0.06403	43.2 D	42.1 V	0.18968	0.18485
2000-2100	0.05213	43.2 D	42.1 V	0.15442	0.15049
2100-2200	0.04560	43.2 D	42.1 V	0.13507	0.13163
2200-2300	0.03854	43.2 D	42.1 V	0.11416	0.11125
2300-2400	0.03701	43.2 D	42.1 V	0.10962	0.10683
0000-0100	0.03345	43.2 D	42.1 V	0.09908	0.09656
0100-0200	0.02950	43.2 D	42.1 V	0.08738	0.08516
0200-0300	0.00000	43.2 D	42.1 V	0.00000	0.00000
0300-0400	0.00000	43.2 D	42.1 V	0.00000	0.00000
0400-0500	0.00000	43.2 D	42.1 V	0.00000	0.00000
0500-0600	0.00000	43.2 D	42.1 V	0.00000	0.00000
0600-0700	0.00442	43.2 D	42.1 V	0.01311	0.01277
0700-0800	0.01185	43.2 D	42.1 V	0.03511	0.03421
0800-0900	0.02225	43.2 D	42.1 V	0.06591	0.06424
0900-1000	0.02681	34.0 V	26.0 D	0.06251	0.04780
1000-1100	0.03060	34.0 V	26.0 D	0.07135	0.05456
1100-1200	0.03374	34.0 V	26.0 D	0.07866	0.06015
1200-1300	0.03580	34.0 V	26.0 D	0.08347	0.06383
1300-1400	0.03731	34.0 V	26.0 D	0.08699	0.06652
<b>TOTAL</b>		<b>41.3</b>	<b>38.7 V</b>	<b>2.41558</b>	<b>2.27372</b>

D - Concentration determined from grab sample at base of dispenser.

V - Concentration determined from grab sample at UST vent riser.

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TABLE 6.1-6  
Vapor Vac Baseline Test July 30, 1998 1400 hrs to July 31, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure (" Hg)	Vent Mass (1000 x lbs as propane)	Notations
1440-1500	1.95	29.93	0.00035	In Calibration 1400-1440 hrs
1500-1600	2.01	29.93	0	
1600-1700	2.13	29.92	0.00025	
1700-1800	2.29	29.92	0.00004	
1800-1900	2.49	29.92	0	
1900-2000	2.31	29.92	0.00156	
2000-2100	2.1	29.92	0	
2100-2200	1.81	29.94	0	In Calibration 2100-2135 hrs
2200-2300	1.82	29.94	0	
2300-2400	1.9	29.94	0.00045	Hourly Mass estimated from Total mass from 2300 to 0500
0000-0100	1.7	29.94	0.00045	Hourly Mass estimated from Total mass from 2300 to 0500
0100-0200	1.55	29.94	0.00045	Hourly Mass estimated from Total mass from 2300 to 0500
0200-0300	1.5	29.94	0.00045	Hourly Mass estimated from Total mass from 2300 to 0500
0300-0400	1.5	29.94	0.00045	Hourly Mass estimated from Total mass from 2300 to 0500
0400-0500	1.45	29.94	0.00045	Hourly Mass estimated from Total mass from 2300 to 0500, Min Pressure
0500-0600	1.46	29.95	0.00002	In Calibration 0500-0540 hrs
0600-0700	1.7	29.96	0.00643	
0700-0800	2.23	29.98	0.0319	
0800-0900	2.24	30	0	
0900-1000	2.18	30.01	0	
1000-1100	2.33	30.03	0.0001	
1100-1200	2.54	30.03	0	Max Pressure
1200-1300	2.54	30.03	0	Max Pressure
1300-1400	2.43	30.01	0.00765	In Calibration 1300-1325
24 hr average	2.01	29.96		

24 Hour Vent Emission Mass (lbs)	0.000051	
24 Hour Product Throughput (gal)	4198	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	2.4012	1.8362
Emission Factor (lb/1000 gal)	0.5720	0.4374
System Efficiency Loss (%)	6.81%	5.21%

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 DRAFT

TABLE 6.1-6A

Gilbarco Vapor Vac. 7/30/98 to 7/31/98					
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)	Low Fugitive Conc (% C3H8)	High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
1400-1500	0.04041	34.0 V	26.0 D	0.09421	0.07204
1500-1600	0.04232	34.0 V	26.0 D	0.09867	0.07545
1600-1630	0.04627	34.0 V	26.0 D	0.10787	0.08249
1700-1800	0.05177	34.0 V	26.0 D	0.12071	0.09231
1800-1900	0.05906	34.0 V	26.0 D	0.13769	0.10529
1900-2000	0.05248	34.0 V	26.0 D	0.12236	0.09357
2000-2100	0.04527	34.0 V	26.0 D	0.10553	0.08070
2100-2200	0.03610	34.0 V	26.0 D	0.08417	0.06436
2200-2300	0.03640	34.0 V	26.0 D	0.08487	0.06490
2300-2400	0.03885	34.0 V	26.0 D	0.09057	0.06926
0000-0100	0.03287	34.0 V	26.0 D	0.07663	0.05860
0100-0200	0.02868	34.0 V	26.0 D	0.06687	0.05113
0200-0300	0.02734	34.0 V	26.0 D	0.06374	0.04874
0300-0400	0.02734	34.0 V	26.0 D	0.06374	0.04874
0400-0500	0.02603	34.0 V	26.0 D	0.06068	0.04640
0500-0600	0.02629	34.0 V	26.0 D	0.06128	0.04686
0600-0700	0.03287	34.0 V	26.0 D	0.07663	0.05860
0700-0800	0.04968	34.0 V	26.0 D	0.11581	0.08856
0800-0900	0.05002	34.0 V	26.0 D	0.11662	0.08918
0900-1000	0.04796	34.0 V	26.0 D	0.11181	0.08550
1000-1100	0.05320	34.0 V	26.0 D	0.12402	0.09484
1100-1200	0.06095	34.0 V	26.0 D	0.14210	0.10866
1200-1300	0.06095	34.0 V	26.0 D	0.14210	0.10866
1300-1400	0.05683	34.0 V	26.0 D	0.13249	0.10131
<b>TOTAL</b>		<b>34.0 V</b>	<b>26.0 D</b>	<b>2.40116</b>	<b>1.83618</b>

D - Concentration determined from grab sample at base of dispenser.  
V - Concentration determined from grab sample at UST vent riser.

June 1999 DRAFT

TABLE 6.1-7

Vapor Vac Baseline Test July 31, 1998 1400 hrs to August 1, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	2.86	30	0.01569	Max Pressure
1500-1600	2.62	30	0	
1600-1630	2.54	29.98	0.00077	
1700-1800	2.41	29.98	0	
1800-1900	2.53	29.98	0.00226	
1900-2000	2.17	29.97	0.05668	
2000-2100	1.99	29.97	0.04763	
2100-2200	0.87	29.98	0.03697	Bulk Drop 2120-2142, Pi=+1.90, Pf=-0.80, In Calibration 2145-2200
2200-2300	0.7	29.98	0.0003	In Calibration 2200-2215, Hourly Mass estimated from Total mass from 2215 to 0430, Min Pressure
2300-2400	1.1	29.98	0.0004	Hourly Mass estimated from Total mass from 2215 to 0430
0000-0100	1.1	29.99	0.0004	Hourly Mass estimated from Total mass from 2215 to 0430
0100-0200	0.95	29.99	0.0004	Hourly Mass estimated from Total mass from 2215 to 0430
0200-0300	0.9	29.99	0.0004	Hourly Mass estimated from Total mass from 2215 to 0430
0300-0400	1.2	29.99	0.0004	Hourly Mass estimated from Total mass from 2215 to 0430
0400-0500	1.25	30	0.0002	In Calibration 0430-0500, Hourly Mass estimated from Total mass from 2215 to 0430
0500-0600	1.06	30	0	In Calibration 0500-0530
0600-0700	1	30.01	0.00621	
0700-0800	1	30.02	0.01477	
0800-0900	1.74	30.03	0.0177	
0900-1000	1.83	30.04	0	Start Summa 0900
1000-1100	2	30.04	0	Stop Summa 1100
1100-1200	2.34	30.02	0.01788	
1200-1300	2.36	30.01	0.04106	
1300-1400	2.22	30	0.00055	In Calibration 1300-1330
24 hr average	1.70	30.00		

24 Hour Vent Mass (lbs)		0.000261
24 Hour Volume Dispensed		5076
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	2.0349	1.5808
Emission Factor (lb/1000 gal)	0.4009	0.3115
System Efficiency Loss (%)	4.77%	3.71%

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

**June 1999 DRAFT**

**TABLE 6.1-7A**

<b>Gilbarco Vapor Vac. 7/31/98 to 8/01/98</b>							
<b>Time</b>	<b>Fugitive Q (acfm)</b>	<b>High Fugitive Conc (% C3H8)</b>	<b>High Fugitive Conc (% C3H8)</b>	<b>Low Fugitive Conc (% C3H8)</b>	<b>Low Fugitive Conc (% C3H8)</b>	<b>High Fugitive mass (lb/hr)</b>	<b>Low Fugitive mass (lb/hr)</b>
1400-1500	0.07371	34.0	D	26.0	V	0.17184	0.13141
1500-1600	0.06403	34.0	D	26.0	V	0.14929	0.11416
1600-1630	0.06095	34.0	D	26.0	V	0.14210	0.10866
1700-1800	0.05609	34.0	D	26.0	V	0.13077	0.10000
1800-1900	0.06057	34.0	D	26.0	V	0.14121	0.10799
1900-2000	0.04762	34.0	D	26.0	V	0.11101	0.08489
2000-2100	0.04168	34.0	D	26.0	V	0.09717	0.07431
2100-2200	0.01282	38.3	D	34.5	V	0.03366	0.03032
2200-2300	0.00965	38.3	D	34.5	V	0.02535	0.02283
2300-2400	0.01761	38.3	D	34.5	V	0.04624	0.04165
0000-0100	0.01761	38.3	D	34.5	V	0.04624	0.04165
0100-0200	0.01442	38.3	D	34.5	V	0.03786	0.03410
0200-0300	0.01341	38.3	D	34.5	V	0.03521	0.03172
0300-0400	0.01987	38.3	D	34.5	V	0.05219	0.04702
0400-0500	0.02105	38.3	D	34.5	V	0.05528	0.04980
0500-0600	0.01673	38.3	D	34.5	V	0.04394	0.03958
0600-0700	0.01545	38.3	D	34.5	V	0.04058	0.03655
0700-0800	0.01545	38.3	D	34.5	V	0.04058	0.03655
0800-0900	0.03403	38.3	D	34.5	V	0.08937	0.08050
0900-1000	0.03670	33.7	D	22.7	V	0.08482	0.05713
1000-1100	0.04200	33.7	D	22.7	V	0.09706	0.06538
1100-1200	0.05355	33.7	D	22.7	V	0.12375	0.08336
1200-1300	0.05427	33.7	D	22.7	V	0.12542	0.08448
1300-1400	0.04933	33.7	D	22.7	V	0.11399	0.07678
<b>TOTAL</b>		<b>36.1</b>	<b>D</b>	<b>29.6</b>	<b>V</b>	<b>2.03494</b>	<b>1.58084</b>

D - Concentration determined from grab sample at base of dispenser.

V - Concentration determined from grab sample at UST vent riser.

June 1999 DRAFT

TABLE 6.1-8

Vapor Vac Baseline Test August 1, 1998 1400 hrs to August 2, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	2.09	29.99	0.07714	Max Pressure
1500-1600	1.75	29.97	0.15647	
1600-1630	1.68	29.97	0.12209	
1700-1800	1.67	29.96	0.01652	
1800-1900	1.50	29.96	0.00009	
1900-2000	1.44	29.96	0.02547	
2000-2100	1.32	29.97	0.10934	
2100-2200	1.18	29.97	0.02183	In Calibration 2100-2125, Hourly Mass estimated from Total mass from 2125 to 0530
2200-2300	1.13	29.97	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
2300-2400	1.07	29.97	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
0000-0100	0.96	29.96	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
0100-0200	0.91	29.96	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
0200-0300	0.86	29.96	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
0300-0400	0.75	29.97	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
0400-0500	0.75	29.98	0.03743	Hourly Mass estimated from Total mass from 2125 to 0530
0500-0600	0.86	29.99	0.01871	In Calibration 0530-0600
0600-0700	0.60	30.00	0.00535	Min Pressure
0700-0800	0.71	30.01	0.07029	
0800-0900	0.99	30.02	0.02759	
0900-1000	1.40	30.01	0.04833	
1000-1100	1.61	30.01	0.11146	
1100-1200	1.72	30.00	0.0515	
1200-1300	1.77	29.99	0.03728	
1300-1400	1.70	29.98	0.00932	In Calibration 1330-1400
24 hr average	1.27	29.98		

24 Hour Vent Mass (lbs)		0.001171
24 Hour Product Throughput (gal)		4307
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	1.2431	0.8373
Emission Factor (lb/1000 gal)	0.2889	0.1947
System Efficiency Loss (%)	3.44%	2.32%

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 DRAFT

TABLE 6.1-8A

Gilbarco Vapor Vac. 8/01/98 to 8/02/98					
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)	Low Fugitive Conc (% C3H8)	High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
1400-1500	0.04493	33.7 V	22.7 D	0.10383	0.06994
1500-1600	0.03432	33.7 V	22.7 D	0.07931	0.05343
1600-1630	0.03230	33.7 V	22.7 D	0.07463	0.05027
1700-1800	0.03201	33.7 V	22.7 D	0.07398	0.04983
1800-1900	0.02734	33.7 V	22.7 D	0.06318	0.04255
1900-2000	0.02577	33.7 V	22.7 D	0.05954	0.04011
2000-2100	0.02274	33.7 V	22.7 D	0.05255	0.03540
2100-2200	0.01941	33.7 V	22.7 D	0.04486	0.03022
2200-2300	0.01828	33.7 V	22.7 D	0.04223	0.02845
2300-2400	0.01695	33.7 V	22.7 D	0.03917	0.02638
0000-0100	0.01462	33.7 V	22.7 D	0.03379	0.02276
0100-0200	0.01361	33.7 V	22.7 D	0.03144	0.02118
0200-0300	0.01262	33.7 V	22.7 D	0.02916	0.01964
0300-0400	0.01055	33.7 V	22.7 D	0.02438	0.01642
0400-0500	0.01055	33.7 V	22.7 D	0.02438	0.01642
0500-0600	0.01262	33.7 V	22.7 D	0.02916	0.01964
0600-0700	0.00794	33.7 V	22.7 D	0.01835	0.01236
0700-0800	0.00983	33.7 V	22.7 D	0.02271	0.01530
0800-0900	0.01524	33.7 V	22.7 D	0.03522	0.02373
0900-1000	0.02474	33.7 V	22.7 D	0.05717	0.03851
1000-1100	0.03033	33.7 V	22.7 D	0.07008	0.04720
1100-1200	0.03345	33.7 V	22.7 D	0.07729	0.05206
1200-1300	0.03491	33.7 V	22.7 D	0.08067	0.05434
1300-1400	0.03287	33.7 V	22.7 D	0.07596	0.05116
<b>TOTAL</b>		<b>33.7 V</b>	<b>22.7 D</b>	<b>1.24305</b>	<b>0.83731</b>

D - Concentration determined from grab sample at base of dispenser.  
V - Concentration determined from grab sample at UST vent riser.

June 1999 DRAFT

TABLE 6.1-9  
Baseline Test August 2, 1998 1400 hrs to August 3, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	1.69	29.97	0.0244	Max Pressure
1500-1600	1.53	29.95	0.01658	
1600-1700	1.44	29.93	0.0004	
1700-1800	1.34	29.93	0.00025	
1800-1900	1.25	29.93	0.00039	
1900-2000	1.09	29.92	0	
2000-2100	0.92	29.93	0	Start Summa 2000
2100-2200	1.30	29.94	0.13654	In Calibration 2100-2130, Stop Summa 2141, Bulk Drop 2146, Pi=+1.00, Pf=+3.20
2200-2300	1.30	29.94	0.24409	
2300-2400	1.20	29.94	0.00081	
0000-0100	1.00	29.94	0.00417	
0100-0200	0.80	29.94	0.00417	
0200-0300	0.70	29.93	0.00417	
0300-0400	0.58	29.92	0.00417	Min Prtessure
0400-0500	0.72	29.92	0.00417	
0500-0600	0.64	29.92	0.01502	In Calibration 0500-0530
0600-0700	0.78	29.93	0.01284	
0700-0800	1.29	29.94	0.05681	
0800-0900	1.63	29.94	0.1133	
0900-1000	1.58	29.93	0.0986	
1000-1100	1.68	29.93	0.14109	
1100-1200	1.59	29.92	0.1691	
1200-1300	1.50	29.90	0.22059	
1300-1400	NR	29.88	NR	In Calibration 1300-1333, NR - Pressure Decay Testing in Progress
24 hr average	1.20	29.93		

24 Hour Vent Mass (lbs)	0.001272	
24 Hour Product Throughput (gal)	4063	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	1.3227	1.1844
Emission Factor (lb/1000 gal)	0.3258	0.2918
System Efficiency Loss (%)	3.88%	3.47%

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

**June 1999 DRAFT**

**TABLE 6.1-9**

**Baseline Test August 2, 1998 1400 hrs to August 3, 1998 1400 hrs**

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	1.69	29.97	0.0244	Max Pressure
1500-1600	1.53	29.95	0.01658	
1600-1700	1.44	29.93	0.0004	
1700-1800	1.34	29.93	0.00025	
1800-1900	1.25	29.93	0.00039	
1900-2000	1.09	29.92	0	
2000-2100	0.92	29.93	0	Start Summa 2000
2100-2200	1.30	29.94	0.13654	In Calibration 2100-2130, Stop Summa 2141, Bulk Drop 2146, Pi=+1.00, Pf=+3.20
2200-2300	1.30	29.94	0.24409	
2300-2400	1.20	29.94	0.00081	
0000-0100	1.00	29.94	0.00417	
0100-0200	0.80	29.94	0.00417	
0200-0300	0.70	29.93	0.00417	
0300-0400	0.58	29.92	0.00417	Min Prtessure
0400-0500	0.72	29.92	0.00417	
0500-0600	0.64	29.92	0.01502	In Calibration 0500-0530
0600-0700	0.78	29.93	0.01284	
0700-0800	1.29	29.94	0.05681	
0800-0900	1.63	29.94	0.1133	
0900-1000	1.58	29.93	0.0986	
1000-1100	1.68	29.93	0.14109	
1100-1200	1.59	29.92	0.1691	
1200-1300	1.50	29.90	0.22059	
1300-1400	NR	29.88	NR	In Calibration 1300-1333, NR - Pressure Decay Testing in Progress
24 hr average	1.20	29.93		

24 Hour Vent Mass (lbs)	0.001272	
24 Hour Product Throughput (gal)	4063	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	1.3227	1.1844
Emission Factor (lb/1000 gal)	0.3258	0.2918
System Efficiency Loss (%)	3.88%	3.47%

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 DRAFT

TABLE 6.1-10

Transition Test August 3, 1998 1400 hrs to August 4, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("WC)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	NR	NR	NR	NR - Not Reported, Pressure Decay Testing in Progress
1500-1600	1.61	29.93	0.01285	Hourly Mass estimated from Total mass from 1400 to 1700
1600-1700	1.26	29.95	0.01285	Hourly Mass estimated from Total mass from 1400 to 1700
1700-1800	1.14	29.82	0.01182	
1800-1900	0.98	29.82	0.00032	
1900-2000	0.74	29.82	0	
2000-2100	0.76	29.82	0	
2100-2200	0.54	29.83	0.00078	Sample System Bias Check and Calibration 2100-2140
2200-2300	0.60	29.82	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500
2300-2400	0.40	29.82	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500
0000-0100	0.35	29.83	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500
0100-0200	0.30	29.83	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500
0200-0300	0.20	29.83	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500
0300-0400	0.16	29.84	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500, Min Pressure
0400-0500	0.30	29.84	0.12226	Hourly Mass estimated from Total mass from 2200 to 0500
0500-0600	0.39	29.84	0.00003	In Calibration 0500-0540
0600-0700	0.57	29.85	0	
0700-0800	0.92	29.86	0.00031	
0800-0900	1.14	29.87	0.03872	0815-0825 Converted six nozzles for ORVR simulation
0900-1000	1.52	29.87	0.09851	0910 Converted two more nozzles for ORVR simulation
1000-1100	1.71	29.87	0.00409	
1100-1200	NR	NR	NR	Pressure Decay Testing in progress
1200-1300	NR	NR	NR	Pressure Decay Testing in progress
1300-1400	1.74	29.85	0.00319	In Calibration 1300-1333, Max Pressure
24 hr average	0.83	29.85		

24 Hour Vent Mass (lbs)	0.001039	
24 Hour Product Throughput (gal)	3646	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	0.7714	0.7618
Emission Factor (lb/1000 gal)	0.2119	0.2092
System Efficiency Loss (%)	2.52%	2.49%

Volume Dispensed via ORVR Simulation Unknown

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 DRAFT

TABLE 6.1-10A

Gilbarco Vapor Vac. 8/03/98 to 8/04/98					
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)	Low Fugitive Conc (% C3H8)	High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
1400-1500	#VALUE!				
1500-1600	0.03033	40.1 D	39.6 V	0.08339	0.08235
1600-1630	0.02129	40.1 D	39.6 V	0.05853	0.05780
1700-1800	0.01850	40.1 D	39.6 V	0.05087	0.05024
1800-1900	0.01503	40.1 D	39.6 V	0.04134	0.04082
1900-2000	0.01037	40.1 D	39.6 V	0.02851	0.02815
2000-2100	0.01073	40.1 D	39.6 V	0.02951	0.02914
2100-2200	0.00697	40.1 D	39.6 V	0.01915	0.01892
2200-2300	0.00794	40.1 D	39.6 V	0.02183	0.02156
2300-2400	0.00485	40.1 D	39.6 V	0.01333	0.01317
0000-0100	0.00415	40.1 D	39.6 V	0.01140	0.01126
0100-0200	0.00347	40.1 D	39.6 V	0.00954	0.00942
0200-0300	0.00220	40.1 D	39.6 V	0.00606	0.00598
0300-0400	0.00173	40.1 D	39.6 V	0.00475	0.00469
0400-0500	0.00347	40.1 D	39.6 V	0.00954	0.00942
0500-0600	0.00471	40.1 D	39.6 V	0.01294	0.01278
0600-0700	0.00745	40.1 D	39.6 V	0.02048	0.02022
0700-0800	0.01381	40.1 D	39.6 V	0.03797	0.03749
0800-0900	0.01850	40.1 D	39.6 V	0.05087	0.05024
0900-1000	0.02787	40.1 D	39.6 V	0.07664	0.07568
1000-1100	0.03316	40.1 D	39.6 V	0.09118	0.09004
1100-1200	#VALUE!	40.1 D	39.6 V		
1200-1300	#VALUE!	40.1 D	39.6 V		
1300-1400	0.03403	40.1 D	39.6 V	0.09357	0.09241
<b>TOTAL</b>		<b>40.1 D</b>	<b>39.6 V</b>	<b>0.77141</b>	<b>0.76179</b>

D - Concentration determined from grab sample at base of dispenser.  
V - Concentration determined from grab sample at UST vent riser.

**June 1999 DRAFT**

**TABLE 6.1-11  
Vapor Vac ORVR Test August 4, 1998 1400 hrs to August 5, 1998 1400 hrs**

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	1.88	29.85	0.00627	
1500-1600	2.21	29.84	0.05997	
1600-1700	2.17	29.82	0.10573	
1700-1800	2.23	29.81	0.11255	
1800-1900	2.18	29.81	0.09161	
1900-2000	2.11	29.82	0.04357	
2000-2100	2.07	29.82	0	
2100-2200	1.90	29.82	0.05734	In Calibration 2100-2115, Hourly Mass estimated from Total mass from 2115-0525
2200-2300	1.65	29.82	0.07652	Hourly Mass estimated from Total mass from 2115-0525
2300-2400	1.70	29.83	0.07652	Hourly Mass estimated from Total mass from 2115-0525
0000-0100	1.65	29.84	0.07652	Hourly Mass estimated from Total mass from 2115-0525
0100-0200	1.55	29.85	0.07652	Hourly Mass estimated from Total mass from 2115-0525
0200-0300	1.55	29.85	0.07652	Hourly Mass estimated from Total mass from 2115-0525
0300-0400	1.50	29.86	0.07652	Hourly Mass estimated from Total mass from 2115-0525, Min Pressure
0400-0500	1.60	29.86	0.07652	Hourly Mass estimated from Total mass from 2115-0525
0500-0600	1.65	29.87	0.03188	In Calibration 0525-0550, Hourly Mass estimated from Total mass from 2115-0525
0600-0700	1.73	29.90	0	
0700-0800	2.00	29.91	0	
0800-0900	2.21	29.93	0.00006	Start Summas 0830
0900-1000	2.51	29.94	0	Summas
1000-1100	2.81	29.94	0.00037	Stop Summas 1000 (dispenser) and 1030 (vent)
1100-1200	3.00	29.94	0.02554	Max Pressure
1200-1300	3.00	29.94	0.00207	Max Pressure
1300-1400	2.80	29.93	0	In Calibration 1300-1335
24 hr average	2.07	29.87		

24 Hour Vent Emission Mass (lbs)	0.001073	
24 Hour Product Throughput (gal)	4381	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	2.201	1.461
Emission Factor (lb/1000 gal)	0.5026	0.3337
System Efficiency Loss (%)	5.98%	3.97%

**42.5% of Volume Dispensed through ORVR Simulation**

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 DRAFT

TABLE 6.1-11A

Gilbarco Vapor Vac. 8/04/98 to 8/05/98					
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)	Low Fugitive Conc (% C3H8)	High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
1400-1500	0.03823	40.1 D	39.6 V	0.10512	0.10381
1500-1600	0.04898	40.1 D	39.6 V	0.13469	0.13301
1600-1630	0.04762	40.1 D	39.6 V	0.13093	0.12930
1700-1800	0.04968	40.1 D	39.6 V	0.13659	0.13489
1800-1900	0.04796	26.2 V	14.9 D	0.08616	0.04900
1900-2000	0.04560	26.2 V	14.9 D	0.08192	0.04659
2000-2100	0.04427	26.2 V	14.9 D	0.07954	0.04523
2100-2200	0.03885	26.2 V	14.9 D	0.06979	0.03969
2200-2300	0.03145	26.2 V	14.9 D	0.05649	0.03213
2300-2400	0.03287	26.2 V	14.9 D	0.05905	0.03358
0000-0100	0.03145	26.2 V	14.9 D	0.05649	0.03213
0100-0200	0.02868	26.2 V	14.9 D	0.05153	0.02930
0200-0300	0.02868	26.2 V	14.9 D	0.05153	0.02930
0300-0400	0.02734	26.2 V	14.9 D	0.04912	0.02793
0400-0500	0.03005	26.2 V	14.9 D	0.05399	0.03070
0500-0600	0.03145	26.2 V	14.9 D	0.05649	0.03213
0600-0700	0.03374	26.2 V	14.9 D	0.06061	0.03447
0700-0800	0.04200	26.2 V	14.9 D	0.07546	0.04291
0800-0900	0.04898	26.2 V	14.9 D	0.08800	0.05005
0900-1000	0.05981	28.9 D	16.3 V	0.11853	0.06685
1000-1100	0.07164	28.9 D	16.3 V	0.14196	0.08007
1100-1200	0.07964	28.9 D	16.3 V	0.15783	0.08902
1200-1300	0.07964	28.9 D	16.3 V	0.15783	0.08902
1300-1400	0.07123	28.9 D	16.3 V	0.14115	0.07961
<b>TOTAL</b>		<b>29.1</b>	<b>19.3</b>	<b>2.20081</b>	<b>1.46073</b>

D - Concentration determined from grab sample at base of dispenser.  
V - Concentration determined from grab sample at UST vent riser.

June 1999 Draft

TABLE 6.1-12  
Vapor Vac ORVR Test August 5, 1998 1400 hrs to August 6, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	2.96	29.91	0	
1500-1600	2.38	29.90	0.03626	Bulk Drop 1528-1550, Pi=+3.00, Pf=+0.55
1600-1700	2.15	29.88	0.01112	Min Pressure
1700-1800	2.56	29.88	0	
1800-1900	2.46	29.88	0	
1900-2000	2.60	29.88	0	
2000-2100	2.76	29.88	0	
2100-2200	2.58	29.89	0	In Calibration 2100-2121
2200-2300	2.55	29.89	0.000014	Hourly Mass estimated from Total mass from 2200-0500
2300-2400	2.85	29.90	0.000014	Hourly Mass estimated from Total mass from 2200-0500
0000-0100	2.90	29.91	0.000014	Hourly Mass estimated from Total mass from 2200-0500
0100-0200	2.85	29.90	0.000014	Hourly Mass estimated from Total mass from 2200-0500
0200-0300	2.90	29.90	0.000014	Hourly Mass estimated from Total mass from 2200-0500
0300-0400	2.90	29.90	0.000014	Hourly Mass estimated from Total mass from 2200-0500,
0400-0500	2.90	29.89	0.000014	Hourly Mass estimated from Total mass from 2200-0500
0500-0600	2.83	29.89	0	In Calibration 0500-0525
0600-0700	2.98	29.90	0.00022	
0700-0800	3.03	29.91	0.03340	
0800-0900	3.30	29.92	23.870	Max Pressure
0900-1000	3.22	29.92	22.332	
1000-1100	3.22	29.92	49.864	
1100-1200	3.06	29.92	15.445	
1200-1300	3.16	29.91	39.429	
1300-1400	3.15	29.90	43.594	
24 hr average	2.84	29.90		

24 Hour Vent Emission Mass (lbs)	0.1946	
24 Hour Product Throughput (gal)	4364	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	3.495	1.971
Emission Factor (lb/1000 gal)	0.8454	0.4963
System Efficiency Loss (%)	10.1%	5.91%

44.7% of Volume Dispensed through ORVR Simulation

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 Draft

TABLE 6.1-12A

Gilbarco Vapor Vac. 8/05/98 to 8/06/98						
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)		Low Fugitive Conc (% C3H8)		Low Fugitive mass (lb/hr)
1400-1500	0.07793	28.9	D	16.3	V	0.08710
1500-1600	0.05500	28.9	D	16.3	V	0.06147
1600-1630	0.04694	28.9	D	16.3	V	0.05246
1700-1800	0.06171	28.9	D	16.3	V	0.06898
1800-1900	0.05794	28.9	D	16.3	V	0.06476
1900-2000	0.06325	28.9	D	16.3	V	0.07070
2000-2100	0.06960	28.9	D	16.3	V	0.07779
2100-2200	0.06248	28.9	D	16.3	V	0.06984
2200-2300	0.06133	28.9	D	16.3	V	0.06855
2300-2400	0.07329	28.9	D	16.3	V	0.08192
0000-0100	0.07538	28.9	D	16.3	V	0.08425
0100-0200	0.07329	28.9	D	16.3	V	0.08192
0200-0300	0.07538	28.9	D	16.3	V	0.08425
0300-0400	0.07538	28.9	D	16.3	V	0.08425
0400-0500	0.07538	28.9	D	16.3	V	0.08425
0500-0600	0.07246	28.9	D	16.3	V	0.08099
0600-0700	0.07878	28.9	D	16.3	V	0.08806
0700-0800	0.08094	28.9	D	16.3	V	0.09047
0800-0900	0.09310	28.9	D	16.3	V	0.10406
0900-1000	0.08941	28.9	D	16.3	V	0.09994
1000-1100	0.08941	28.9	D	16.3	V	0.09994
1100-1200	0.08226	28.9	D	16.3	V	0.09194
1200-1300	0.08670	28.9	D	16.3	V	0.09690
1300-1400	0.08625	28.9	D	16.3	V	0.09640
<b>TOTAL</b>		<b>28.9</b>	<b>D</b>	<b>16.3</b>	<b>V</b>	<b>1.97119</b>

D - Concentration determined from grab sample at base of dispenser.

V - Concentration determined from grab sample at UST vent riser.

June 1999 DRAFT

TABLE 6.1-13

Vapor Vac Baseline Test August 6, 1998 1400 hrs to August 7, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	3.17	29.89	43.237	
1500-1600	3.00	29.87	8.5675	In Calibration 1500-1525
1600-1630	2.94	29.86	6.8684	
1700-1800	3.12	29.85	50.552	
1800-1900	3.06	29.85	21.019	
1900-2000	2.86	29.85	19.195	
2000-2100	2.96	29.85	43.015	Start Vent Line Summa 2000
2100-2200	2.84	29.86	4.1412	In Calibration 2100-2135, Stop Summa 2200
2200-2300	2.90	29.86	7.8643	Hourly Mass estimated from Total mass from 2200-0500
2300-2400	2.95	29.86	7.8643	Hourly Mass estimated from Total mass from 2200-0500
0000-0100	2.95	29.85	7.8643	Hourly Mass estimated from Total mass from 2200-0500
0100-0200	2.90	29.85	7.8643	Hourly Mass estimated from Total mass from 2200-0500
0200-0300	2.90	29.85	7.8643	Hourly Mass estimated from Total mass from 2200-0500
0300-0400	2.80	29.85	7.8643	Hourly Mass estimated from Total mass from 2200-0500
0400-0500	2.82	29.85	7.8643	Hourly Mass estimated from Total mass from 2200-0500
0500-0600	2.93	29.86	0.82093	In Calibration 0500-0535
0600-0700	2.94	29.87	2.4759	
0700-0800	3.21	29.88	56.017	Max Pressure
0800-0900	2.96	29.89	26.520	Start Summas 0810
0900-1000	2.95	29.89	16.471	End Summas 0942
1000-1100	2.95	29.89	15.020	
1100-1200	2.78	29.89	45.614	Bulk Drop 1144, Pi=+3.00
1200-1300	2.74	29.89	0.96717	End Bulk Drop 1212, Pf=+1.40, Min Pressure
1300-1400	3.09	29.88	22.188	In Calibration 1330-1400
24 hr average	2.95	29.87		

24 Hour Vent Mass (lbsx1000)	0.438	
24 Hour Volume Dispensed (gal)	4355	
	<b>HIGH</b>	<b>LOW</b>
24 Fugitive Emission (lbs)	3.883	2.271
Emission Factor (lb/1000 gal)	0.9920	0.6219
System Efficiency Loss (%)	11.8%	7.40%

44.6% of Volume Dispensed through ORVR Simulation

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

June 1999 DRAFT

TABLE 6.1-13A

Gilbarco Vapor Vac. 8/06/98 to 8/07/98					
Time	Fugitive Q (acfm)	High Fugitive Conc (% C3H8)	Low Fugitive Conc (% C3H8)	High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
1400-1500	0.08715	28.9 D	16.3 V	0.17270	0.09740
1500-1600	0.07964	28.9 D	16.3 V	0.15783	0.08902
1600-1630	0.07707	28.9 D	16.3 V	0.15273	0.08614
1700-1800	0.08491	28.9 D	16.3 V	0.16826	0.09490
1800-1900	0.08226	28.9 D	16.3 V	0.16301	0.09194
1900-2000	0.07371	28.9 D	16.3 V	0.14606	0.08238
2000-2100	0.07793	28.9 D	16.3 V	0.15442	0.08710
2100-2200	0.07288	28.9 D	16.3 V	0.14442	0.08145
2200-2300	0.07538	28.9 D	16.3 V	0.14938	0.08425
2300-2400	0.07750	28.9 D	16.3 V	0.15358	0.08662
0000-0100	0.07750	28.9 D	16.3 V	0.15358	0.08662
0100-0200	0.07538	28.9 D	16.3 V	0.14938	0.08425
0200-0300	0.07538	28.9 D	16.3 V	0.14938	0.08425
0300-0400	0.07123	28.9 D	16.3 V	0.14115	0.07961
0400-0500	0.07205	28.9 D	16.3 V	0.14278	0.08053
0500-0600	0.07665	28.9 D	16.3 V	0.15189	0.08567
0600-0700	0.07707	28.9 D	16.3 V	0.15273	0.08614
0700-0800	0.08896	28.9 D	16.3 V	0.17629	0.09943
0800-0900	0.07793	35.3 U	22.5 V	0.18862	0.12023
0900-1000	0.07750	35.3 U	22.5 V	0.18759	0.11957
1000-1100	0.07750	35.3 U	22.5 V	0.18759	0.11957
1100-1200	0.07041	35.3 U	22.5 V	0.17043	0.10863
1200-1300	0.06879	35.3 U	22.5 V	0.16651	0.10613
1300-1400	0.08358	35.3 U	22.5 V	0.20230	0.12895
<b>TOTAL</b>		<b>30.5</b>	<b>17.9</b>	<b>3.88263</b>	<b>2.27080</b>

U - Concentration determined from grab sample at top of Phase I drop tube.  
V - Concentration determined from grab sample at UST vent riser.

June 1999 DRAFT

TABLE 6.1-14  
Vapor Vac Baseline Test August 7, 1998 1400 hrs to August 8, 1998 1400 hrs

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	3.01	29.87	88.291	
1500-1600	2.92	29.86	44.266	
1600-1630	3.01	29.85	83.322	
1700-1800	2.94	29.84	69.773	
1800-1900	3.00	29.83	92.158	
1900-2000	2.95	29.84	52.173	
2000-2100	2.92	29.84	55.021	
2100-2200	3.00	29.85	11.499	In Calibration 2100-2120, Hourly Mass Estimated from total mass from 2120-0520
2200-2300	3.10	29.86	17.249	Hourly Mass Estimated from total mass from 2120-0520
2300-2400	3.30	29.87	17.249	Hourly Mass Estimated from total mass from 2120-0520, Max Pressure
0000-0100	3.20	29.88	17.249	Hourly Mass Estimated from total mass from 2120-0520
0100-0200	3.10	29.87	17.249	Hourly Mass Estimated from total mass from 2120-0520
0200-0300	3.10	29.87	17.249	Hourly Mass Estimated from total mass from 2120-0520
0300-0400	3.05	29.87	17.249	Hourly Mass Estimated from total mass from 2120-0520
0400-0500	3.10	29.88	17.249	Hourly Mass Estimated from total mass from 2120-0520
0500-0600	3.10	29.89	5.75	In Calibration 0520-0550, Hourly Mass Estimated from total mass from 2120-0520
0600-0700	2.75	29.90	4.5502	
0700-0800	2.72	29.92	0.88105	
0800-0900	2.71	29.93	0.34346	Min Pressure
0900-1000	3.07	29.93	20.489	
1000-1100	3.05	29.93	50.249	
1100-1200	2.95	29.94	36.67	
1200-1300	2.99	29.94	54.182	
1300-1400	2.92	29.94	37.787	In Calibration 1330-1350
24 hr average	3.00	29.88		

24 Hour Vent Emission Mass (lbs)	0.8281	
24 Hour Product Throughput (gal)	4061	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	4.629	2.950
Emission Factor (lb/1000 gal)	1.3437	0.9304
System Efficiency Loss (%)	16.0%	11.1%

48.8% of Volume Dispensed through ORVR Simulation

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

**June 1999 DRAFT**

**TABLE 6.1-14A**

<b>Gilbarco Vapor Vac. 8/07/98 to 8/08/98</b>					
<b>Time</b>	<b>Fugitive Q (acfm)</b>	<b>High Fugitive Conc (% C3H8)</b>	<b>Low Fugitive Conc (% C3H8)</b>	<b>High Fugitive mass (lb/hr)</b>	<b>Low Fugitive mass (lb/hr)</b>
1400-1500	0.08008	35.3 U	22.5 V	0.19383	0.12355
1500-1600	0.07622	35.3 U	22.5 V	0.18450	0.11760
1600-1630	0.08008	35.3 U	22.5 V	0.19383	0.12355
1700-1800	0.07707	35.3 U	22.5 V	0.18656	0.11891
1800-1900	0.07964	35.3 U	22.5 V	0.19278	0.12288
1900-2000	0.07750	35.3 U	22.5 V	0.18759	0.11957
2000-2100	0.07622	35.3 U	22.5 V	0.18450	0.11760
2100-2200	0.07964	35.3 U	22.5 V	0.19278	0.12288
2200-2300	0.08402	35.3 U	22.5 V	0.20337	0.12963
2300-2400	0.09310	35.3 U	22.5 V	0.22536	0.14364
0000-0100	0.08850	35.3 U	22.5 V	0.21423	0.13655
0100-0200	0.08402	35.3 U	22.5 V	0.20337	0.12963
0200-0300	0.08402	35.3 U	22.5 V	0.20337	0.12963
0300-0400	0.08182	35.3 U	22.5 V	0.19804	0.12623
0400-0500	0.08402	35.3 U	22.5 V	0.20337	0.12963
0500-0600	0.08402	35.3 U	22.5 V	0.20337	0.12963
0600-0700	0.06919	35.3 U	22.5 V	0.16748	0.10675
0700-0800	0.06799	35.3 U	22.5 V	0.16456	0.10489
0800-0900	0.06758	35.3 U	22.5 V	0.16359	0.10427
0900-1000	0.08269	35.3 U	22.5 V	0.20017	0.12759
1000-1100	0.08182	35.3 U	22.5 V	0.19804	0.12623
1100-1200	0.07750	35.3 U	22.5 V	0.18759	0.11957
1200-1300	0.07921	35.3 U	22.5 V	0.19174	0.12221
1300-1400	0.07622	35.3 U	22.5 V	0.18450	0.11760
<b>TOTAL</b>		<b>35.3 U</b>	<b>22.5 V</b>	<b>4.62855</b>	<b>2.95021</b>

U - Concentration determined from grab sample at top of Phase I drop tube.  
V - Concentration determined from grab sample at UST vent riser.

June 1999 DRAFT

TABLE 6.1-15  
Vapor Vac Baseline Test August 8, 1998 1400 hrs to August 9, 1998 1400 hrs

Time Period	System Pressure (" WC gage)	Barometric Pressure ("Hg)	Vent Mass (1000 x lbs as propane)	Notations
1400-1500	3.08	29.92	104.22	
1500-1600	3.05	29.92	124.16	
1600-1630	3.02	29.91	86.265	
1700-1800	2.98	29.91	75.691	
1800-1900	2.96	29.90	50.016	
1900-2000	2.97	29.90	61.23	
2000-2100	2.88	29.91	10.422	Start Summas 2050
2100-2200	2.92	29.93	5.249	In Calibrationm 2100-2145
2200-2300	2.58	29.92	66.202	Stop Summas 2250
2300-2400	2.82	29.92	9.9974	
0000-0100	2.76	29.93	3.3083	Hourly Mass Estimated from total mass from 2400 to 0500
0100-0200	2.75	29.94	2.647	Hourly Mass Estimated from total mass from 2400 to 0500
0200-0300	2.84	29.94	2.647	Hourly Mass Estimated from total mass from 2400 to 0500
0300-0400	2.75	29.94	2.647	Hourly Mass Estimated from total mass from 2400 to 0500
0400-0500	2.65	29.95	2.647	Hourly Mass Estimated from total mass from 2400 to 0500
0500-0600	2.65	29.96	0.01209	In Calibration from 0500-0520m 2100-2145
0600-0700	2.61	29.97	0.10218	
0700-0800	2.52	29.98	0.01475	Min Pressure
0800-0900	2.55	30.00	0.05109	
0900-1000	2.88	30.01	0.20804	
1000-1100	3.17	30.01	62.686	Max Pressure
1100-1200	3.03	30.01	81.164	
1200-1300	3.10	30.00	115.57	
1300-1400	2.89	29.99	25.621	In Calibration from 1337-1400
24 hr average	2.85	29.95		

24 Hour Vent Emission Mass (lbs)	0.8928	
24 Hour Product Throughput (gal)	4017	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission (lbs)	3.250	2.017
Emission Factor (lb/1000 gal)	1.0313	0.7243
System Efficiency Loss (%)	12.3%	8.62%

44.0% of Volume Dispensed through ORVR Simulation

Basis: 8.4 lb/1000 gal Uncontrolled Emissions

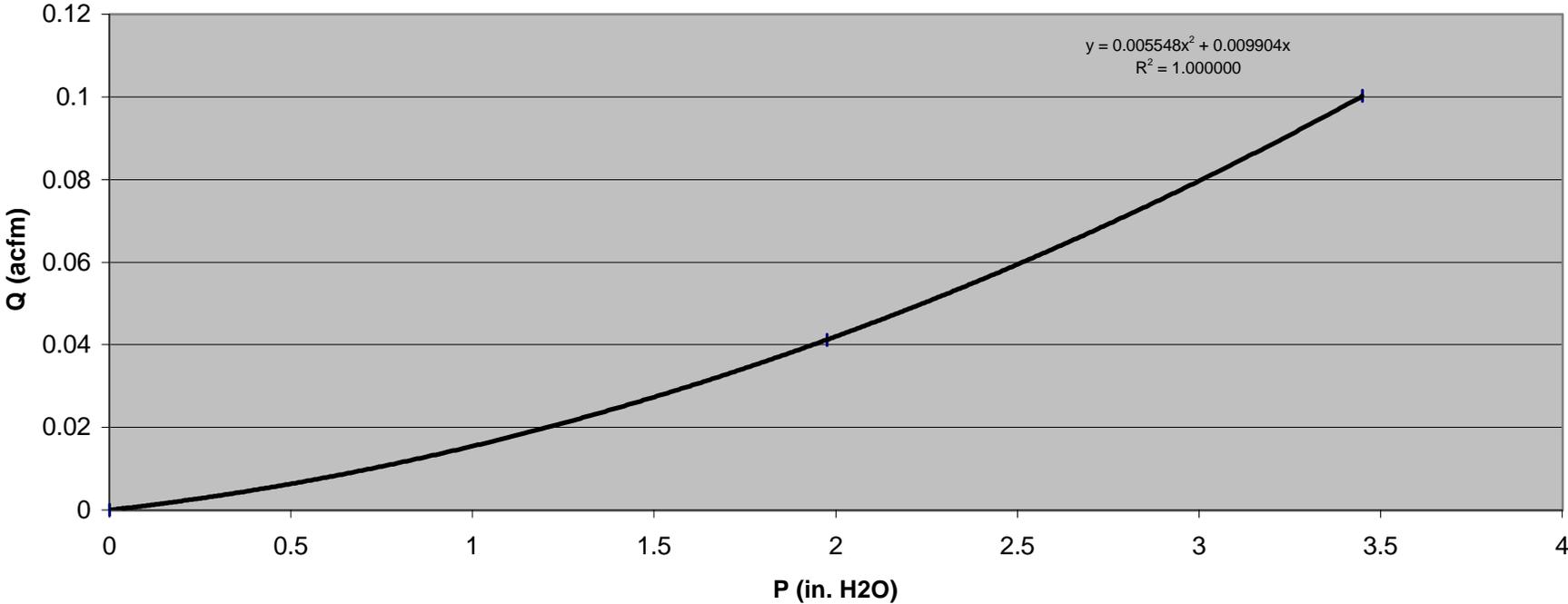
**June 1999 DRAFT**

**TABLE 6.1-15A**

<b>Gilbarco Vapor Vac. 8/08/98 to 8/09/98</b>					
<b>Time</b>	<b>Fugitive Q (acfm)</b>	<b>High Fugitive Conc (% C3H8)</b>	<b>Low Fugitive Conc (% C3H8)</b>	<b>High Fugitive mass (lb/hr)</b>	<b>Low Fugitive mass (lb/hr)</b>
1400-1500	0.08313	35.3 U	22.5 V	0.20123	0.12826
1500-1600	0.08182	35.3 U	22.5 V	0.19804	0.12623
1600-1630	0.08051	35.3 U	22.5 V	0.19488	0.12421
1700-1800	0.07878	35.3 U	22.5 V	0.19070	0.12155
1800-1900	0.07793	35.3 U	22.5 V	0.18862	0.12023
1900-2000	0.07835	35.3 U	22.5 V	0.18966	0.12089
2000-2100	0.07454	35.3 U	22.5 V	0.18043	0.11501
2100-2200	0.07622	23.0 V	14.0 U	0.12022	0.07317
2200-2300	0.06248	23.0 V	14.0 U	0.09854	0.05998
2300-2400	0.07205	23.0 V	14.0 U	0.11363	0.06917
0000-0100	0.06960	23.0 V	14.0 U	0.10976	0.06681
0100-0200	0.06919	23.0 V	14.0 U	0.10913	0.06642
0200-0300	0.07288	23.0 V	14.0 U	0.11493	0.06996
0300-0400	0.06919	23.0 V	14.0 U	0.10913	0.06642
0400-0500	0.06521	23.0 V	14.0 U	0.10284	0.06260
0500-0600	0.06521	23.0 V	14.0 U	0.10284	0.06260
0600-0700	0.06364	23.0 V	14.0 U	0.10037	0.06110
0700-0800	0.06019	23.0 V	14.0 U	0.09493	0.05778
0800-0900	0.06133	23.0 V	14.0 U	0.09673	0.05888
0900-1000	0.07454	23.0 V	14.0 U	0.11756	0.07156
1000-1100	0.08715	23.0 V	14.0 U	0.13744	0.08366
1100-1200	0.08094	23.0 V	14.0 U	0.12766	0.07771
1200-1300	0.08402	23.0 V	14.0 U	0.13251	0.08066
1300-1400	0.07496	23.0 V	14.0 U	0.11822	0.07196
<b>TOTAL</b>		<b>26.6</b>	<b>16.5</b>	<b>3.25001</b>	<b>2.01682</b>

U - Concentration determined from grab sample at top of Phase I drop tube.  
V - Concentration determined from grab sample at UST vent riser.

**2" Pre ORVR and 3.5" Post ORVR Pressure Decay Tests  
(8/4/98 & 8/10/98)  
Gilbarco VaporVac, El Sobrante**



**June 1999 DRAFT**

**TABLE 6.2-1**

**Emission Data Summary  
Baseline with P/V Valve  
Dresser Industries Wayne Vac  
Sacramento, CA**

Date	Test Mode	Product Dispensed (gallons)	Avg. Hydrocarbon Concentration (% as Propane)		Individual Emission Factors (lb / 1000 gal)			Total Emission Factors (lb / 1000 gal)		Efficiency Loss (percent)		P/V Installed (y/n)		
			Vent	UST	Fugitive		Vent	High	Low	High	Low		High	Low
					High	Low								
Sep 8-9	Baseline	6942	12.5	9.7	0.0317	0.0261	0.00	0.0317	0.0261	0.38	0.031	Yes		
Sep 9-10	Baseline	6548	24.1	10.0	0.0287	0.0151	0.00	0.0287	0.0151	0.34	0.18	Yes		
Sep10-11	Baseline	7232	37.0	9.3	0.0885	0.0245	0.00	0.0885	0.0245	1.05	0.29	Yes		
Sep11-12	Baseline	5239	33.6	4.8	0.0507	0.00756	0.00	0.0507	0.00756	0.60	0.090	Yes		
Sep12-13	Baseline	5299	35.4	5.0	0.00392	5.84E-4	0.00	0.00392	5.84E-4	0.045	0.007	Yes		
<b>Average</b>	<b>Baseline</b>	<b>6252</b>	<b>28.5</b>	<b>7.8</b>	<b>0.0407</b>	<b>0.0148</b>	<b>0.00</b>	<b>0.0407</b>	<b>0.0148</b>	<b>0.48</b>	<b>0.16</b>	<b>Yes</b>		

NOTE:

Vent hydrocarbon concentration determined by NDIR continuous gas analyzer at ground level in vent riser.  
UST hydrocarbon concentration determined by summa canister grab samples at phase 1 vapor return receptacle.

TABLE 6.2-2

**Emission Data Summary  
ORVR Simulation with P/V Valve Installed  
Dresser Industries Wayne Vac  
Sacramento, CA**

Date	Percent ORVR	Product Dispensed (gallons)	Avg. Hydrocarbon Concentration (% as Propane)		Individual Emission Factors (lb / 1000 gal)			Total Emission Factors (lb / 1000 gal)		Efficiency Loss (percent)		P/V Installed (y/n)		
			Vent	UST	Fugitive		Vent	High	Low	High	Low		High	Low
					High	Low								
Sep13-14	Transition	4942	30.6	7.2	0.0141	0.00478	0.00	0.0141	0.00478	0.17	0.057	Yes		
Sep14-15	41.6 %	6183	14.1	8.2	0.0660	0.0374	0.00	0.0660	0.0374	0.79	0.45	Yes		
Sep15-16	41.1 %	6200	19.6	10.1	0.186	0.0960	0.00	0.186	0.0960	2.22	1.14	Yes		
Sep16-17	42.6 %	6171	14.0	10.4	0.0267	0.0198	0.00	0.0267	0.0198	0.32	0.24	Yes		
Sep17-18	32.7 %	6851	14.9	12.4	0.0403	0.0329	0.00	0.0403	0.0329	0.48	0.39	Yes		
<b>Average</b>	<b>39.5 %</b>	<b>6351</b>	<b>15.6</b>	<b>10.3</b>	<b>0.0798</b>	<b>0.0465</b>	<b>0.00</b>	<b>0.0798</b>	<b>0.0465</b>	<b>0.95</b>	<b>0.55</b>	<b>Yes</b>		

NOTE:

Vent hydrocarbon concentration determined by NDIR continuous gas analyzer at ground level in vent riser.  
 UST hydrocarbon concentration determined by summa canister grab samples at phase 1 vapor return receptacle.  
 Average data does not include transition period.

TABLE 6.2-3

**Emission Data Summary  
ORVR Simulation, P/V Valve Removed  
Dresser Industries Wayne Vac  
Sacramento, CA**

Date	Test Mode	Product Dispensed (gallons)	Avg. Hydrocarbon Concentration (% as Propane)		Emission Factors (lb / 1000 gal)		Efficiency Loss (percent)	Percent ORVR Dispensed
			Vent	UST	Vent	Fugitive		
Sep 18-19	Transition	5471	29.6	14.8	0.308	0.00	3.67	NA
Sep 19-20	ORVR no PV	4718	28.1	16.1	0.458	0.00	5.45	36.3
Sep 20-21	ORVR no PV	6801	26.0	16.1	0.213	0.00	2.54	41.0
Sep 21-22	ORVR no PV	6480	24.4	8.8	0.312	0.00	3.72	39.2
Sep 22-23	ORVR no PV	6236	22.9	8.8	0.323	0.00	3.84	40.6
Sep 23-24	ORVR no PV	7084	22.5	13.3	0.235	0.00	2.80	37.8
Sep 24-25	ORVR no PV	6460	21.9	13.3	0.294	0.00	3.50	39.2
Sep 25-26	ORVR no PV	5547	21.4	12.4	0.306	0.00	3.65	36.0
Sep 26-27	ORVR no PV	4996	22.7	12.4	0.173	0.00	2.06	35.8
<b>Average</b>	ORVR no PV	<b>6040</b>	<b>23.7</b>	<b>14.5</b>	<b>0.328</b>	<b>0.00</b>	<b>3.90</b>	<b>38.2</b>

NOTE:

Vent hydrocarbon concentration determined by NDIR continuous gas analyzer at ground level in vent riser.  
UST hydrocarbon concentration determined by summa canister grab samples at phase 1 vapor return receptacle.  
Average data does not include transition period.

**June 1999 DRAFT**

**TABLE 6.2-4**

**Emission Data Summary  
Baseline Testing, P/V Valve Removed  
Dresser Industries Wayne Vac  
Sacramento, CA**

Date	Test Mode	Product Dispensed (gallons)	Avg. Hydrocarbon Concentration (% as Propane)		Emission Factors (lb / 1000 gal)		Efficiency Loss (percent)	P/V Installed (y/n)
			Vent	UST	Vent	Fugitive		
Sep 27-28	Transition	6638	20.7	12.7	0.229	0.00	2.72	NA
Sep 28-29	Transition	6279	21.1	12.7	0.259	0.00	3.08	NA
Sep 29-30	Baseline	6123	4.9	25.9	0.0147	0.00	0.18	No
Sep30-Oct1	Baseline	6459	4.6	25.9	0.022	0.00	0.26	No
Oct 1-2	Baseline	7201	4.2	3.1	0.0403	0.00	0.48	No
Oct 2-3	Baseline	5822	1.4	3.1	0.00264	0.00	0.031	No
Oct 3-4	Baseline	4933	2.5	19.7	0.0598	0.00	0.71	No
Oct 4-5	Baseline	6186	1.6	19.7	0.0165	0.00	0.20	No
<b>Average</b>	<b>Baseline</b>	<b>6121</b>	<b>3.2</b>	<b>16.2</b>	<b>0.0260</b>	<b>0.00</b>	<b>0.31</b>	<b>No</b>

NOTE:

Vent hydrocarbon concentration determined by NDIR continuous gas analyzer at ground level in vent riser.  
 UST hydrocarbon concentration determined by summa canister grab samples at phase 1 vapor return receptacle.  
 Average data does not include transition period.

**TABLE 6.2-5**  
**Summa Canister Grab Sample Results**  
**Baseline Test with P/V Valve, Wayne Vac, Sacramento**

DATE	SAMPLE ID	TIME		LOCATION	HYDROCARBONS (% PROPANE)
		START	STOP		
September 9, 1998	98-0440	1500	1700	Vent Riser	10.0 %
September 11, 1998	98-0468	1650	1950	Phase I Drop Tube	4.8 %
September 13, 1998	98-0464	1900	2100	Phase I Drop Tube	7.6 %

**TABLE 6.2-6**  
**Summa Canister Grab Sample Results**  
**ORVR Simulation with P/V Valve, Wayne Vac, Sacramento**

DATE	SAMPLE ID	TIME		LOCATION	HYDROCARBONS (% PROPANE)
		START	STOP		
September 15, 1998	98-0465	1500	1700	Phase I Drop Tube	10.1 %
September 17, 1998	98-0467	1540	1730	Phase I Drop Tube	14.8 %

<b>TABLE 6.2-7</b> <b>Summa Canister Grab Sample Results</b> <b>ORVR Simulation without P/V Valve, Wayne Vac, Sacramento</b>					
DATE	SAMPLE ID	TIME		LOCATION	HYDROCARBONS (% PROPANE)
		START	STOP		
September 19, 1998	98-0466	2030	2230	Phase I Drop Tube	16.1 %
September 21, 1998	98-0469	1500	1600	Phase I Drop Tube	8.8 %
September 23, 1998	98-0475	2000	2200	Phase I Drop Tube	13.3 %
September 25, 1998	98-0476	1930	2205	Phase I Drop Tube	12.4 %
September 27, 1998	98-0477	2000	2200	Phase I Drop Tube	12.7 %

<b>TABLE 6.2-8</b> <b>Summa Canister Grab Sample Results</b> <b>Baseline Testing without P/V Valve, Wayne Vac, Sacramento</b>					
DATE	SAMPLE ID	TIME		LOCATION	HYDROCARBONS (% PROPANE)
		START	STOP		
September 28, 1998	98-0479	1515	1700	Phase I Drop Tube	25.9 %
October 1, 1998	98-0478	1730	1955	Phase I Drop Tube	3.1 %
October 3, 1998	98-0494	2115	2300	Phase I Drop Tube	19.7 %
October 5, 1998	98-0495	1835	2050	Phase I Drop Tube	28.9 %

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TABLE 6.2-9  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
 Baseline Testing with P/V Valve, Raley Blvd., Sacramento, 9/8/98 to 9/9/98

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	-0.10	29.63	12.5	0.00000	Instrument Calibration 2100-2125
2200-2300	-0.12	29.64	13.0	0.00000	
2300-2400	-0.12	29.65	13.0	0.00000	
0000-0100	-0.15	29.67	12.5	0.00000	
0100-0200	-0.20	29.67	12.5	0.00000	
0200-0300	0.00	29.67	13.0	0.00000	
0300-0400	-0.80	29.67	15.0	0.00000	Bulk Drop @ 0345, -7.0<system pressure<0.10 Instrument Calibration 0430-0500
0400-0500	-2.10	29.67	13.5	0.00000	
0500-0600	-0.87	29.67	5.0	0.00000	
0600-0700	-0.22	29.71	7.0	0.00000	
0700-0800	0.13	29.73	10.0	0.00016	
0800-0900	0.33	29.75	11.0	0.00000	
0900-1000	0.46	29.77	12.0	0.00000	
1000-1100	0.58	29.79	12.0	0.00000	
1100-1200	0.61	29.79	12.0	0.00000	
1200-1300	0.75	29.78	12.5	0.00000	
1300-1400	0.67	29.78	12.5	0.00008	
1400-1500	0.56	29.78	12.0	0.00000	
1500-1600	0.30	29.77	13.0	0.00035	Start UST Summa @ 1500
1600-1700	-0.10	29.77	13.0	0.00002	Stop UST Summa @ 1700
1700-1800	-0.13	29.77	13.5	0.00000	
1800-1900	-0.11	29.78	13.5	0.00000	
1900-2000	0.00	29.79	13.5	0.00007	
2000-2100	-0.11	29.81	13.5	0.00000	Instrument Calibration 2030-2100
24 hr average	-0.03	29.73	12.1		

24 Hour Vent Emission Mass (lbsx1000)	0.00068	
24 Hour Product Throughput (gal)	6942	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission Mass (lbs)	0.2198	0.1810
Emission Factor (lb/1000 gal)	0.0317	0.0261
System Efficiency Decrease (%)	0.38%	0.31%

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**TABLE 6.2-9A**  
**ORVR Interaction Testing, Wayne Vac System, 9/08/98 to 9/09/98**  
**Baseline Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0	12.5	V	10.0	U	0.00000	0.00000
2200-2300	0	13.0	V	10.0	U	0.00000	0.00000
2300-2400	0	13.0	V	10.0	U	0.00000	0.00000
0000-0100	0	12.5	V	10.0	U	0.00000	0.00000
0100-0200	0	12.5	V	10.0	U	0.00000	0.00000
0200-0300	0	13.0	V	10.0	U	0.00000	0.00000
0300-0400	0	15.0	V	10.0	U	0.00000	0.00000
0400-0500	0	13.5	V	10.0	U	0.00000	0.00000
0500-0600	0	10.0	U	5.0	V	0.00000	0.00000
0600-0700	0	10.0	U	7.0	V	0.00000	0.00000
0700-0800	0.004751	10.0	V	10.0	U	0.00326	0.00326
0800-0900	0.015676	11.0	V	10.0	U	0.01182	0.01075
0900-1000	0.025129	12.0	V	10.0	U	0.02068	0.01723
1000-1100	0.035498	12.0	V	10.0	U	0.02921	0.02434
1100-1200	0.038337	12.0	V	10.0	U	0.03155	0.02629
1200-1300	0.05289	12.5	V	10.0	U	0.04533	0.03627
1300-1400	0.044311	12.5	V	10.0	U	0.03798	0.03038
1400-1500	0.03366	12.0	V	10.0	U	0.02770	0.02308
1500-1600	0.013758	13.0	V	10.0	U	0.01226	0.00943
1600-1700	0	13.0	V	10.0	U	0.00000	0.00000
1700-1800	0	13.5	V	10.0	U	0.00000	0.00000
1800-1900	0	13.5	V	10.0	U	0.00000	0.00000
1900-2000	0	13.5	V	10.0	U	0.00000	0.00000
2000-2100	0	13.5	V	10.0	U	0.00000	0.00000
<b>TOTALS</b>		<b>12.5</b>		<b>9.7</b>		<b>0.21979</b>	<b>0.18104</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

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TABLE 6.2-10  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
 Baseline Testing with P/V Valve, Raley Blvd., Sacramento, 9/9/98 to 9/10/98

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	-0.07	29.83	13.5	0.00000	
2200-2300	0.06	29.84	13.5	0.00000	
2300-2400	0.13	29.85	10.0	0.00000	
0000-0100	0.20	29.87	10.0	0.00000	
0100-0200	0.25	29.87	13.0	0.00000	
0200-0300	0.38	29.87	14.0	0.00000	
0300-0400	0.40	29.87	15.5	0.00000	
0400-0500	0.42	29.87	15.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.26	29.89	18.0	0.00000	
0600-0700	0.14	29.90	18.0	0.00000	
0700-0800	0.05	29.91	19.0	0.00000	
0800-0900	0.03	29.92	20.0	0.00000	
0900-1000	0.13	29.92	20.0	0.00000	
1000-1100	0.13	29.92	21.0	0.00000	
1100-1200	0.06	29.91	19.0	0.00000	
1200-1300	0.07	29.90	20.0	0.00000	Instrument Calibration 1230-1300
1300-1400	0.15	29.88	21.5	0.00000	
1400-1500	0.01	29.86	43.0	0.00800	Bulk Drop @ 1410, -0.80<system pressure<1.10
1500-1600	0.00	29.84	45.0	0.00014	
1600-1700	0.18	29.83	45.0	0.00000	
1700-1800	0.16	29.82	43.5	0.00003	
1800-1900	0.07	29.81	40.5	0.00000	
1900-2000	0.03	29.81	41.0	0.00000	
2000-2100	0.04	29.81	40.5	0.00000	Instrument Calibration 2030-2100
24 hr average	0.14	29.87	24.1		

24 Hour Vent Emission Mass (lbsx1000)	0.00817	
24 Hour Product Throughput (gal)	6548	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission Mass (lbs)	0.1878	0.0986
Emission Factor (lb/1000 gal)	0.0287	0.0151
System Efficiency Decrease (%)	0.34%	0.18%

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**TABLE 6.2-10A**  
**ORVR Interaction Testing, Wayne Vac System, 9/09/98 to 9/10/98**  
**Baseline Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0	13.5	V	10.0	U	0.00000	0.00000
2200-2300	0.001962	13.5	V	10.0	U	0.00182	0.00135
2300-2400	0.004751	10.0	V	10.0	U	0.00326	0.00326
0000-0100	0.008076	10.0	V	10.0	U	0.00554	0.00554
0100-0200	0.01078	13.0	V	10.0	U	0.00961	0.00739
0200-0300	0.019093	14.0	V	10.0	U	0.01833	0.01309
0300-0400	0.020536	15.5	V	10.0	U	0.02183	0.01408
0400-0500	0.022023	15.0	V	10.0	U	0.02265	0.01510
0500-0600	0.011354	18.0	V	10.0	U	0.01401	0.00779
0600-0700	0.005193	18.0	V	10.0	U	0.00641	0.00356
0700-0800	0.001608	19.0	V	10.0	U	0.00209	0.00110
0800-0900	0.000932	20.0	V	10.0	U	0.00128	0.00064
0900-1000	0.004751	20.0	V	10.0	U	0.00652	0.00326
1000-1100	0.004751	21.0	V	10.0	U	0.00684	0.00326
1100-1200	0.001962	19.0	V	10.0	U	0.00256	0.00135
1200-1300	0.002328	20.0	V	10.0	U	0.00319	0.00160
1300-1400	0.005646	21.5	V	10.0	U	0.00832	0.00387
1400-1500	0.0003	43.0	V	10.0	U	0.00088	0.00021
1500-1600	0	45.0	V	10.0	U	0.00000	0.00000
1600-1700	0.007071	45.0	V	10.0	U	0.02182	0.00485
1700-1800	0.00611	43.5	V	10.0	U	0.01823	0.00419
1800-1900	0.002328	40.5	V	10.0	U	0.00646	0.00160
1900-2000	0.000932	41.0	V	10.0	U	0.00262	0.00064
2000-2100	0.001264	40.5	V	10.0	U	0.00351	0.00087
<b>TOTALS</b>		<b>24.1</b>		<b>10.0</b>		<b>0.18778</b>	<b>0.09857</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

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TABLE 6.2.11  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
 Baseline Testing with P/V Valve, Raley Blvd., Sacramento, 9/10/98 to 9/11/98

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.17	29.82	39.5	0.00010	Instrument Calibration 2100-2130
2200-2300	0.24	29.82	38.0	0.00000	
2300-2400	0.41	29.81	38.0	0.00000	
0000-0100	0.48	29.80	35.0	0.00000	
0100-0200	0.37	29.80	35.0	0.00000	
0200-0300	0.38	29.80	35.5	0.00000	
0300-0400	0.45	29.80	35.5	0.00000	
0400-0500	0.44	29.80	38.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.52	29.80	33.0	0.00000	
0600-0700	0.38	29.81	34.5	0.00000	
0700-0800	0.30	29.82	36.0	0.00000	
0800-0900	0.05	29.83	37.0	0.00000	
0900-1000	0.02	29.83	38.0	0.00000	
1000-1100	0.14	29.83	38.5	0.00000	
1100-1200	0.19	29.82	38.0	0.00010	
1200-1300	0.19	29.81	37.0	0.00000	Instrument Calibration 1230-1300
1300-1400	0.11	29.79	37.5	0.00000	
1400-1500	0.26	29.77	38.0	0.00000	
1500-1600	0.19	29.75	38.3	0.00000	
1600-1700	-0.11	29.74	38.0	0.00000	Start UST Summa @ 1650
1700-1800	-1.00	29.73	38.0	0.00000	Bulk Drop @ 1710, -1.50<system pressure<-0.20
1800-1900	-0.89	29.73	38.0	0.00000	
1900-2000	-0.69	29.74	36.5	0.00000	Stop UST Summa @ 1950
2000-2100	-0.52	29.75	36.5	0.00000	Instrument Calibration 2030-2100
24 hr average	0.09	29.79	37.0		

24 Hour Vent Emission Mass (lbsx1000)	0.00020	
24 Hour Product Throughput (gal)	7232	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission Mass (lbs)	0.6404	0.1773
Emission Factor (lb/1000 gal)	0.0885	0.0245
System Efficiency Decrease (%)	1.05%	0.29%

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TABLE 6.2-11A  
 ORVR Interaction Testing, Wayne Vac System, 9/10/98 to 9/11/98  
 Baseline Testing with P/V Valve, Raley Blvd., Sacramento

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0.006585	39.5	V	10.0	U	0.01784	0.00452
2200-2300	0.010217	38.0	V	10.0	U	0.02662	0.00701
2300-2400	0.021274	38.0	V	10.0	U	0.05543	0.01459
0000-0100	0.026748	35.0	V	10.0	U	0.06419	0.01834
0100-0200	0.018388	35.0	V	10.0	U	0.04413	0.01261
0200-0300	0.019093	35.5	V	10.0	U	0.04648	0.01309
0300-0400	0.024336	35.5	V	10.0	U	0.05924	0.01669
0400-0500	0.023554	38.0	V	10.0	U	0.06137	0.01615
0500-0600	0.030116	33.0	V	10.0	U	0.06815	0.02065
0600-0700	0.019093	34.5	V	10.0	U	0.04517	0.01309
0700-0800	0.013758	36.0	V	10.0	U	0.03396	0.00943
0800-0900	0.001608	37.0	V	10.0	U	0.00408	0.00110
0900-1000	0.00061	38.0	V	10.0	U	0.00159	0.00042
1000-1100	0.005193	38.5	V	10.0	U	0.01371	0.00356
1100-1200	0.007568	38.0	V	10.0	U	0.01972	0.00519
1200-1300	0.007568	37.0	V	10.0	U	0.01920	0.00519
1300-1400	0.003899	37.5	V	10.0	U	0.01003	0.00267
1400-1500	0.011354	38.0	V	10.0	U	0.02958	0.00779
1500-1600	0.007568	38.3	V	10.0	U	0.01988	0.00519
1600-1700	0	38.0	V	4.8	U	0.00000	0.00000
1700-1800	0	38.0	V	4.8	U	0.00000	0.00000
1800-1900	0	38.0	V	4.8	U	0.00000	0.00000
1900-2000	0	36.5	V		U	0.00000	0.00000
2000-2100	0	36.5	V		U	0.00000	0.00000
<b>TOTALS</b>		<b>37.0</b>		<b>9.3</b>		<b>0.64037</b>	<b>0.17728</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

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TABLE 6.2-12  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
 Baseline Testing with P/V Valve, Raley Blvd., Sacramento, 9/11/98 to 9/12/98

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	-0.19	29.76	36.0	0.00000	
2200-2300	0.04	29.76	35.0	0.00000	
2300-2400	0.09	29.77	35.0	0.00000	
0000-0100	0.10	29.77	33.0	0.00000	
0100-0200	0.38	29.77	31.5	0.00000	
0200-0300	0.40	29.77	31.0	0.00000	
0300-0400	0.35	29.77	31.5	0.00000	
0400-0500	0.47	29.78	32.5	0.00000	Instrument Calibration 0400-0430
0500-0600	0.29	29.79	32.0	0.00000	
0600-0700	0.21	29.81	32.5	0.00000	
0700-0800	0.03	29.83	35.0	0.00000	
0800-0900	0.08	29.84	35.5	0.00000	
0900-1000	0.03	29.85	37.0	0.00000	
1000-1100	-0.04	29.85	36.7	0.00000	
1100-1200	-0.05	29.84	35.5	0.00000	
1200-1300	-0.01	29.83	35.5	0.00000	Instrument Calibration 1230-1300
1300-1400	0.08	29.80	34.0	0.00000	
1400-1500	0.03	29.78	33.5	0.00000	
1500-1600	0.00	29.75	33.5	0.00000	
1600-1700	-0.02	29.73	32.0	0.00000	
1700-1800	-0.16	29.72	32.5	0.00000	
1800-1900	-0.20	29.72	32.5	0.00000	
1900-2000	-0.16	29.72	32.0	0.00000	
2000-2100	-0.29	29.73	31.5	0.00000	
24 hr average	0.06	29.78	33.6		

24 Hour Vent Emission Mass (lbsx1000)	0.00000	
24 Hour Product Throughput (gal)	5239	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission Mass (lbs)	0.2654	0.0396
Emission Factor (lb/1000 gal)	0.0507	0.0076
System Efficiency Decrease (%)	0.60%	0.09%

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**TABLE 6.2-12A**  
**ORVR Interaction Testing, Wayne Vac System, 9/11/98 to 9/12/98**  
**Baseline Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0	36.0	V	4.8	U	0.00000	0.00000
2200-2300	0.001264	35.0	V	4.8	U	0.00303	0.00042
2300-2400	0.003092	35.0	V	4.8	U	0.00742	0.00102
0000-0100	0.00349	33.0	V	4.8	U	0.00790	0.00115
0100-0200	0.019093	31.5	V	4.8	U	0.04124	0.00628
0200-0300	0.020536	31.0	V	4.8	U	0.04365	0.00676
0300-0400	0.01701	31.5	V	4.8	U	0.03674	0.00560
0400-0500	0.025933	32.5	V	4.8	U	0.05779	0.00854
0500-0600	0.01314	32.0	V	4.8	U	0.02883	0.00433
0600-0700	0.008595	32.5	V	4.8	U	0.01915	0.00283
0700-0800	0.000932	35.0	V	4.8	U	0.00224	0.00031
0800-0900	0.002704	35.5	V	4.8	U	0.00658	0.00089
0900-1000	0.000932	37.0	V	4.8	U	0.00236	0.00031
1000-1100	0	36.7	V	4.8	U	0.00000	0.00000
1100-1200	0	35.5	V	4.8	U	0.00000	0.00000
1200-1300	0	35.5	V	4.8	U	0.00000	0.00000
1300-1400	0.002704	34.0	V	4.8	U	0.00630	0.00089
1400-1500	0.000932	33.5	V	4.8	U	0.00214	0.00031
1500-1600	0	33.5	V	4.8	U	0.00000	0.00000
1600-1700	0	32.0	V	4.8	U	0.00000	0.00000
1700-1800	0	32.5	V	4.8	U	0.00000	0.00000
1800-1900	0	32.5	V	4.8	U	0.00000	0.00000
1900-2000	0	32.0	V	4.8	U	0.00000	0.00000
2000-2100	0	31.5	V	4.8	U	0.00000	0.00000
<b>TOTALS</b>		<b>33.6</b>		<b>4.8</b>		<b>0.26540</b>	<b>0.03961</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

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TABLE 6.2-13  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
 Baseline Testing with P/V Valve, Raley Blvd., Sacramento, 9/12/98 - 9/13/98

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	-0.25	29.73	32.0	0.00000	Instrument Calibration 2130-2200
2200-2300	-0.11	29.73	29.0	0.00000	
2300-2400	-0.11	29.74	29.0	0.00000	
0000-0100	0.00	29.74	25.5	0.00000	
0100-0200	0.10	29.74	26.0	0.00000	
0200-0300	0.05	29.74	26.0	0.00000	
0300-0400	0.00	29.74	26.0	0.00000	
0400-0500	0.02	29.76	30.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.00	29.77	30.0	0.00000	Replaced Sleeve Pump @ 0530
0600-0700	-0.07	29.78	31.0	0.00000	
0700-0800	-0.14	29.79	31.0	0.00000	
0800-0900	-0.24	29.79	35.0	0.00000	
0900-1000	-0.44	29.80	43.0	0.00000	Bulk Drop @ 0925 -1.65<system pressure<0.50
1000-1100	-0.71	29.80	45.0	0.00000	
1100-1200	-0.18	29.79	43.0	0.00000	
1200-1300	-0.09	29.78	42.0	0.00002	Instrument Calibration 1230-1300
1300-1400	0.09	29.76	41.0	0.00005	
1400-1500	0.02	29.74	41.0	0.00011	
1500-1600	-0.08	29.72	40.0	0.00000	
1600-1700	-0.18	29.71	41.0	0.00096	
1700-1800	-0.26	29.70	41.0	0.00021	
1800-1900	-0.36	29.70	42.0	0.00000	
1900-2000	-0.30	29.72	40.0	0.00000	Start UST Summa @ 1900
2000-2100	-0.34	29.71	40.0	0.00000	Calibration 2030-2100, Stop UST Summa @ 2100
24 hr average	-0.15	29.75	35.4		

24 Hour Vent Emission Mass (lbsx1000)	0.00135	
24 Hour Product Throughput (gal)	5299	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission Mass (lbs)	0.0208	0.0031
Emission Factor (lb/1000 gal)	0.0039	0.0006
System Efficiency Decrease (%)	0.047%	0.007%

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**TABLE 6.2-13A**  
**ORVR Interaction Testing, Wayne Vac System, 9/12/98 to 9/13/98**  
**Baseline Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0	32.0	V	4.8	U	0.00000	0.00000
2200-2300	0	29.0	V	4.8	U	0.00000	0.00000
2300-2400	0	29.0	V	4.8	U	0.00000	0.00000
0000-0100	0	25.5	V	4.8	U	0.00000	0.00000
0100-0200	0.00349	26.0	V	4.8	U	0.00622	0.00115
0200-0300	0.001608	26.0	V	4.8	U	0.00287	0.00053
0300-0400	0	26.0	V	4.8	U	0.00000	0.00000
0400-0500	0.00061	30.0	V	4.8	U	0.00126	0.00020
0500-0600	0	30.0	V	4.8	U	0.00000	0.00000
0600-0700	0	31.0	V	4.8	U	0.00000	0.00000
0700-0800	0	31.0	V	4.8	U	0.00000	0.00000
0800-0900	0	35.0	V	4.8	U	0.00000	0.00000
0900-1000	0	43.0	V	4.8	U	0.00000	0.00000
1000-1100	0	45.0	V	4.8	U	0.00000	0.00000
1100-1200	0	43.0	V	4.8	U	0.00000	0.00000
1200-1300	0	42.0	V	4.8	U	0.00000	0.00000
1300-1400	0.003092	41.0	V	4.8	U	0.00869	0.00102
1400-1500	0.00061	41.0	V	4.8	U	0.00172	0.00020
1500-1600	0	40.0	V	4.8	U	0.00000	0.00000
1600-1700	0	41.0	V	4.8	U	0.00000	0.00000
1700-1800	0	41.0	V	4.8	U	0.00000	0.00000
1800-1900	0	42.0	V	4.8	U	0.00000	0.00000
1900-2000	0	40.0	V	7.6	U	0.00000	0.00000
2000-2100	0	40.0	V	7.6	U	0.00000	0.00000
<b>TOTALS</b>		<b>35.4</b>		<b>5.0</b>		<b>0.02075</b>	<b>0.00310</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

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TABLE 6.2-14  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
 Baseline to ORVR Transition with P/V Valve, Raley Blvd., Sacramento, 9/13/98 - 9/14/98

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	-0.28	29.73	36.0	0.00000	
2200-2300	-0.09	29.73	36.0	0.00000	
2300-2400	-0.07	29.73	36.5	0.00000	
0000-0100	0.00	29.73	34.0	0.00000	
0100-0200	0.05	29.73	34.0	0.00000	
0200-0300	0.10	29.73	33.5	0.00000	
0300-0400	0.10	29.73	33.5	0.00000	
0400-0500	0.08	29.73	33.5	0.00000	Instrument Calibration 0430-0500
0500-0600	0.04	29.75	34.0	0.00000	Replaced Sleeve Pump @ 0530
0600-0700	-0.16	29.76	33.5	0.00000	
0700-0800	-0.33	29.78	33.5	0.00000	
0800-0900	-0.38	29.79	30.8	0.00000	
0900-1000	-0.05	29.80	37.0	0.00000	
1000-1100	-0.05	29.80	36.0	0.00000	ORVR Simulation Dispenser Conversion
1100-1200					No Data, ORVR Simulation Dispenser Conversion
1200-1300					No Data, ORVR Simulation Dispenser Conversion
1300-1400					No Data, ORVR Simulation Dispenser Conversion
1400-1500					No Data, ORVR Simulation Dispenser Conversion
1500-1600					No Data, ORVR Simulation Dispenser Conversion
1600-1700					No Data, ORVR Simulation Dispenser Conversion
1700-1800					No Data, ORVR Simulation Dispenser Conversion
1800-1900	0.55	29.70	18.0	0.00007	Start UST Summa @ 1900
1900-2000	0.01	29.72	0.0	0.00000	Bulk Drop @ 1930 -1.30<system pressure<0.25
2000-2100	-0.13	29.73	13.0	0.00000	Calibration 2030-2100, Stop UST Summa @ 2100
24 hr average	-0.04	29.75	30.2		

24 Hour Vent Emission Mass (lbsx1000)	0.00007	
24 Hour Product Throughput (gal)	4942	
	<b>HIGH</b>	<b>LOW</b>
24 Hour Fugitive Emission Mass (lbs)	0.0695	0.0236
Emission Factor (lb/1000 gal)	0.0141	0.0048
System Efficiency Decrease (%)	0.17%	0.057%

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**TABLE 6.2-14A**  
**ORVR Interaction Testing, Wayne Vac System, 9/13/98 to 9/14/98**  
**Transition Mode Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0	36.0	V	7.6	U	0.00000	0.00000
2200-2300	0	36.0	V	7.6	U	0.00000	0.00000
2300-2400	0	36.5	V	7.6	U	0.00000	0.00000
0000-0100	0	34.0	V	7.6	U	0.00000	0.00000
0100-0200	0.001608	34.0	V	7.6	U	0.00375	0.00084
0200-0300	0.00349	33.5	V	7.6	U	0.00802	0.00182
0300-0400	0.00349	33.5	V	7.6	U	0.00802	0.00182
0400-0500	0.002704	33.5	V	7.6	U	0.00621	0.00141
0500-0600	0.001264	34.0	V	7.6	U	0.00295	0.00066
0600-0700	0	33.5	V	7.6	U	0.00000	0.00000
0700-0800	0	33.5	V	7.6	U	0.00000	0.00000
0800-0900	0	30.8	V	7.6	U	0.00000	0.00000
0900-1000	0	37.0	V	7.6	U	0.00000	0.00000
1000-1100	0	36.0	V	7.6	U	0.00000	0.00000
1100-1200	0						
1200-1300	0						
1300-1400	0						
1400-1500	0						
1500-1600	0						
1600-1700	0						
1700-1800	0						
1800-1900	0.032758	18.0	V	7.6		0.04043	0.01707
1900-2000	0.0003	7.6	U	0.0		0.00016	0.00000
2000-2100	0	13.0	V	7.6		0.00000	0.00000
<b>TOTALS</b>		<b>30.6</b>		<b>7.2</b>		<b>0.06953</b>	<b>0.02362</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

**TABLE 6.2-15**  
**ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento, 9/14/98 to 9/15/98**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.02	29.74	16.5	0.00000	Instrument Calibration 2130-2200
2200-2300	0.13	29.75	16.5	0.00000	
2300-2400	0.21	29.76	13.0	0.00000	
0000-0100	0.25	29.77	11.0	0.00000	
0100-0200	0.30	29.77	11.0	0.00000	
0200-0300	0.40	29.77	10.5	0.00000	
0300-0400	0.35	29.77	11.0	0.00000	
0400-0500	0.32	29.79	13.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.39	29.80	10.5	0.00000	
0600-0700	0.46	29.80	10.5	0.00000	
0700-0800	0.33	29.82	10.5	0.00000	
0800-0900	0.25	29.84	13.0	0.00000	
0900-1000	0.28	29.85	15.5	0.00000	Bulk Drop @ 0925 -1.65<system pressure<0.50
1000-1100	0.32	29.86	16.5	0.00000	
1100-1200	0.43	29.86	15.0	0.00005	
1200-1300	0.49	29.85	16.5	0.00000	Instrument Calibration 1230-1300
1300-1400	0.64	29.83	15.0	0.00000	
1400-1500	0.65	29.81	16.0	0.00000	
1500-1600	0.53	29.79	16.0	0.00000	Start UST Summa @ 1500
1600-1700	0.32	29.78	16.0	0.00000	Stop UST Summa @ 1700
1700-1800	0.21	29.77	16.0	0.00000	
1800-1900	0.13	29.77	16.0	0.00000	
1900-2000	0.09	29.78	16.0	0.00005	
2000-2100	0.14	29.79	16.0	0.00000	Instrument Calibration 2030-2100
24 hr average	0.32	29.80	14.1		

24 Hour Vent Emission Mass (lbsx1000)	0.00010		
24 Hour Product Throughput (gal)	6183		
	<b>HIGH</b>	<b>LOW</b>	<b>41.6% of Product Throughput via ORVR Simulation</b>
24 Hour Fugitive Emission Mass (lbs)	0.4079	0.2313	
Emission Factor (lb/1000 gal)	0.0660	0.0374	
System Efficiency Decrease (%)	0.79%	0.45%	

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**TABLE 6.2-15A**  
**ORVR Interaction Testing, Wayne Vac System, 9/14/98 to 9/15/98**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	-0.000057848	16.5	V	7.6	U	0.00000	0.00000
2200-2300	0.001824472	16.5	V	7.6	U	0.00206	0.00095
2300-2400	0.005532408	13.0	V	7.6	U	0.00493	0.00288
0000-0100	0.008125	11.0	V	7.6	U	0.00613	0.00423
0100-0200	0.0120582	11.0	V	7.6	U	0.00910	0.00628
0200-0300	0.0222328	10.5	V	7.6	U	0.01601	0.01159
0300-0400	0.0167608	11.0	V	7.6	U	0.01264	0.00873
0400-0500	0.013846912	13.0	V	7.6	U	0.01234	0.00722
0500-0600	0.021076848	10.5	V	7.6	U	0.01518	0.01098
0600-0700	0.029814808	10.5	V	7.6	U	0.02147	0.01554
0700-0800	0.014787432	10.5	V	7.6	U	0.01065	0.00771
0800-0900	0.008125	13.0	V	7.6	U	0.00724	0.00423
0900-1000	0.010392592	15.5	V	7.6	U	0.01105	0.00542
1000-1100	0.013846912	16.5	V	7.6	U	0.01567	0.00722
1100-1200	0.025885312	15.0	V	7.6	U	0.02662	0.01349
1200-1300	0.034021288	16.5	V	7.6	U	0.03849	0.01773
1300-1400	0.059208448	15.0	V	7.6	U	0.06090	0.03086
1400-1500	0.0611338	16.0	V	7.6	U	0.06707	0.03186
1500-1600	0.040060792	16.0	V	10.1	U	0.04395	0.02774
1600-1700	0.013846912	16.0	V	10.1	U	0.01519	0.00959
1700-1800	0.005532408	16.0	V	10.1	U	0.00607	0.00383
1800-1900	0.001824472	16.0	V	10.1	U	0.00200	0.00126
1900-2000	0.000709128	16.0	V	10.1	U	0.00078	0.00049
2000-2100	0.002180248	16.0	V	10.1	U	0.00239	0.00151
<b>TOTALS</b>		<b>14.1</b>		<b>8.2</b>		<b>0.40793</b>	<b>0.23135</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

**TABLE 6.2-16**  
**ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento, 9/15/98 - 9/16/98**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.18	29.81	15.0	0.00000	
2200-2300	0.28	29.81	15.0	0.00000	
2300-2400	0.31	29.82	15.0	0.00000	
0000-0100	0.42	29.83	14.0	0.00000	
0100-0200	0.50	29.83	14.0	0.00000	
0200-0300	0.55	29.83	14.0	0.00000	
0300-0400	0.00	29.83	28.0	0.00000	Bulk Drop @ 0330 -1.80<system pressure<0.75
0400-0500	-0.33	29.83	28.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.27	29.83	28.0	0.00000	
0600-0700	0.46	29.84	23.0	0.00000	
0700-0800	0.56	29.86	20.0	0.00000	
0800-0900	0.64	29.87	22.0	0.00000	
0900-1000	0.71	29.87	23.0	0.00000	
1000-1100	0.66	29.88	23.0	0.00000	
1100-1200	0.67	29.88	21.0	0.00000	
1200-1300	0.77	29.87	23.0	0.00000	Instrument Calibration 1230-1300
1300-1400	0.80	29.84	18.0	0.00000	
1400-1500	0.77	29.82	18.0	0.00000	
1500-1600	0.63	29.80	18.0	0.00000	
1600-1700	0.50	29.78	18.0	0.00000	
1700-1800	0.35	29.77	18.0	0.00000	
1800-1900	0.12	29.78	18.0	0.00000	
1900-2000	0.16	29.78	18.0	0.00000	
2000-2100	0.16	29.78	18.0	0.00000	Instrument Calibration 2030-2100
24 hr average	0.42	29.83	19.6		

24 Hour Vent Emission Mass (lbsx1000)	0.00000	
24 Hour Product Throughput (gal)	6200	<b>41.1% of Product Throughput via ORVR Simulation</b>
	<b>HIGH</b>	
	<b>LOW</b>	
24 Hour Fugitive Emission Mass (lbs)	1.1562	0.5954
Emission Factor (lb/1000 gal)	0.1865	0.0960
System Efficiency Decrease (%)	2.22%	1.14%

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**TABLE 6.2-16A**  
**ORVR Interaction Testing, Wayne Vac System, 9/15/98 to 9/16/98**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0.003911	15.0	V	10.1	U	0.00402	0.00271
2200-2300	0.010393	15.0	V	10.1	U	0.01069	0.00720
2300-2400	0.012937	15.0	V	10.1	U	0.01331	0.00896
0000-0100	0.024637	14.0	V	10.1	U	0.02365	0.01706
0100-0200	0.035485	14.0	V	10.1	U	0.03407	0.02458
0200-0300	0.043265	14.0	V	10.1	U	0.04153	0.02996
0300-0400	0	28.0	V	10.1	U	0.00000	0.00000
0400-0500	0	28.0	V	10.1	U	0.00000	0.00000
0500-0600	0.009606	28.0	V	10.1	U	0.01844	0.00665
0600-0700	0.029815	23.0	V	10.1	U	0.04702	0.02065
0700-0800	0.044914	20.0	V	10.1	U	0.06160	0.03111
0800-0900	0.059208	22.0	V	10.1	U	0.08932	0.04101
0900-1000	0.073332	23.0	V	10.1	U	0.11565	0.05079
1000-1100	0.06309	23.0	V	10.1	U	0.09950	0.04369
1100-1200	0.065077	21.0	V	10.1	U	0.09371	0.04507
1200-1300	0.086639	23.0	V	10.1	U	0.13664	0.06000
1300-1400	0.093707	18.0	V	10.1	U	0.11566	0.06490
1400-1500	0.086639	18.0	V	10.1	U	0.10694	0.06000
1500-1600	0.057314	18.0	V	10.1	U	0.07074	0.03969
1600-1700	0.035485	18.0	V	10.1	U	0.04380	0.02458
1700-1800	0.016761	18.0	V	10.1	U	0.02069	0.01161
1800-1900	0.001499	18.0	V	10.1	U	0.00185	0.00104
1900-2000	0.002984	18.0	V	10.1	U	0.00368	0.00207
2000-2100	0.002984	18.0	V	10.1	U	0.00368	0.00207
<b>TOTALS</b>		<b>19.6</b>		<b>10.1</b>		<b>1.15620</b>	<b>0.59539</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

**TABLE 6.2-17**  
**ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento, 9/16/98 - 9/17/98**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.12	29.81	15.0	0.00000	
2200-2300	0.17	29.83	15.0	0.00000	
2300-2400	0.23	29.83	14.0	0.00000	
0000-0100	0.34	29.84	14.0	0.00000	
0100-0200	0.37	29.84	14.0	0.00000	
0200-0300	0.34	29.84	15.0	0.00000	
0300-0400	0.30	29.84	15.0	0.00000	
0400-0500	0.33	29.84	14.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.29	29.84	18.0	0.00000	
0600-0700	0.17	29.86	15.0	0.00000	
0700-0800	0.07	29.88	16.0	0.00000	
0800-0900	0.08	29.90	17.5	0.00000	
0900-1000	0.09	29.91	13.5	0.00000	
1000-1100	-0.04	29.93	11.0	0.00000	
1100-1200	0.03	29.93	11.0	0.00000	
1200-1300	0.11	29.92	11.0	0.00000	Instrument Calibration 1230-1300
1300-1400	0.24	29.92	11.0	0.00000	Bulk Drop @ 1350, 0.00<system pressure<1.60
1400-1500	0.53	29.90	11.5	0.00000	
1500-1600	0.11	29.89	11.0	0.00000	Start UST Summa @ 1540
1600-1700	0.16	29.89	11.0	0.00000	
1700-1800	0.09	29.90	11.0	0.00000	Stop UST Summa @ 1725
1800-1900	0.14	29.90	12.0	0.00000	
1900-2000	0.23	29.91	11.5	0.00000	
2000-2100	0.22	29.92	11.0	0.00000	Instrument Calibration 2030-2100
24 hr average	0.20	29.88	13.3		

24 Hour Vent Emission Mass (lbsx1000)	0.00000		
24 Hour Product Throughput (gal)	6171		
	<b>HIGH</b>	<b>LOW</b>	<b>42.6% of Product Throughput via ORVR Simulation</b>
24 Hour Fugitive Emission Mass (lbs)	0.1640	0.1220	
Emission Factor (lb/1000 gal)	0.0266	0.0198	
System Efficiency Decrease (%)	0.32%	0.24%	

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**TABLE 6.2-17A**  
**ORVR Interaction Testing, Wayne Vac System, 9/16/98 to 9/17/98**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0.001499	15.0	V	10.1	U	0.00154	0.00104
2200-2300	0.003432	15.0	V	10.1	U	0.00353	0.00238
2300-2400	0.006767	14.0	V	10.1	U	0.00650	0.00469
0000-0100	0.015759	14.0	V	10.1	U	0.01513	0.01091
0100-0200	0.018857	14.0	V	10.1	U	0.01810	0.01306
0200-0300	0.015759	15.0	V	10.1	U	0.01621	0.01091
0300-0400	0.012058	15.0	V	10.1	U	0.01240	0.00835
0400-0500	0.014787	14.0	V	10.1	U	0.01420	0.01024
0500-0600	0.01121	18.0	V	10.1	U	0.01384	0.00776
0600-0700	0.003432	15.0	V	10.1	U	0.00353	0.00238
0700-0800	0.000336	16.0	V	10.1	U	0.00037	0.00023
0800-0900	0.000507	17.5	V	10.1	U	0.00061	0.00035
0900-1000	0.000709	13.5	V	10.1	U	0.00066	0.00049
1000-1100	0	11.0	V	10.1	U	0.00000	0.00000
1100-1200	-4.1E-05	11.0	V	10.1	U	0.00000	0.00000
1200-1300	0.001205	11.0	V	10.1	U	0.00091	0.00083
1300-1400	0.007431	11.0	V	10.1	U	0.00560	0.00515
1400-1500	0.040061	11.5	V	10.1	U	0.03159	0.02774
1500-1600	0.001205	14.1	U	11.0	V	0.00117	0.00091
1600-1700	0.002984	14.1	U	11.0	V	0.00289	0.00225
1700-1800	0.000709	14.1	U	11.0	V	0.00069	0.00053
1800-1900	0.00218	14.1	U	12.0	V	0.00211	0.00179
1900-2000	0.006767	14.1	U	11.5	V	0.00654	0.00534
2000-2100	0.006134	14.1	U	11.0	V	0.00593	0.00463
<b>TOTALS</b>		<b>14.0</b>		<b>10.4</b>		<b>0.16403</b>	<b>0.12198</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

**TABLE 6.2-18**  
**ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento, 9/17/98 - 9/18/98**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.18	29.96	11.5	0.00004	
2200-2300	0.21	29.97	11.0	0.00000	
2300-2400	0.25	29.99	11.0	0.00000	
0000-0100	0.35	29.99	10.0	0.00000	
0100-0200	0.40	29.99	10.0	0.00000	
0200-0300	0.38	29.99	10.0	0.00000	
0300-0400	0.40	29.99	10.5	0.00000	
0400-0500	0.33	30.00	11.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.36	30.01	10.0	0.00000	
0600-0700	0.19	30.02	11.0	0.00000	
0700-0800	0.17	30.05	11.5	0.00000	
0800-0900	0.22	30.06	13.0	0.00000	
0900-1000	0.18	30.08	16.5	0.00000	
1000-1100	0.28	30.08	15.0	0.00000	
1100-1200	0.38	30.08	14.0	0.00000	
1200-1300	0.33	30.07	13.5	0.00000	Instrument Calibration 1230-1300
1300-1400	0.26	30.04	13.5	0.00000	
1400-1500	0.32	30.01	13.5	0.00000	
1500-1600	0.35	30.00	13.5	0.00000	
1600-1700	0.31	29.98	14.0	0.00002	
1700-1800	0.31	29.97	14.0	0.00000	
1800-1900	0.30	29.96	14.0	0.00000	
1900-2000					No Data, Pressure Decay Testing in Progress
2000-2100					No Data, Pressure Decay Testing in Progress
24 hr average	0.29	30.01	12.4		

24 Hour Vent Emission Mass (lbsx1000)	0.00006		
24 Hour Product Throughput (gal)	6851		
	<b>HIGH</b>	<b>LOW</b>	<b>32.7% of Product Throughput via ORVR Simulation</b>
24 Hour Fugitive Emission Mass (lbs)	0.2764	0.2256	
Emission Factor (lb/1000 gal)	0.0403	0.0329	
System Efficiency Decrease (%)	0.48%	0.39%	

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**TABLE 6.2-18A**  
**ORVR Interaction Testing, Wayne Vac System, 9/17/98 to 9/18/98**  
**ORVR Simulation Testing with P/V Valve, Raley Blvd., Sacramento**

Time	Fugitive Q (acfm)	High Fugitive Conc (%C3H8)		Low Fugitive Conc (%C3H8)		High Fugitive mass (lb/hr)	Low Fugitive mass (lb/hr)
2100-2200	0.003911	14.8	U	11.5	V	0.00397	0.00308
2200-2300	0.005532	14.8	U	11.0	V	0.00561	0.00417
2300-2400	0.008125	14.8	U	11.0	V	0.00825	0.00613
0000-0100	0.016761	14.8	U	10.0	V	0.01701	0.01149
0100-0200	0.022233	14.8	U	10.0	V	0.02256	0.01525
0200-0300	0.019952	14.8	U	10.0	V	0.02025	0.01368
0300-0400	0.022233	14.8	U	10.5	V	0.02256	0.01601
0400-0500	0.014787	14.8	U	11.0	V	0.01501	0.01115
0500-0600	0.017794	14.8	U	10.0	V	0.01806	0.01220
0600-0700	0.004421	14.8	U	11.0	V	0.00449	0.00333
0700-0800	0.003432	14.8	U	11.5	V	0.00348	0.00271
0800-0900	0.006134	14.8	U	13.0	V	0.00623	0.00547
0900-1000	0.003911	16.5	V	16.5	U	0.00443	0.00443
1000-1100	0.010393	15.0	V	15.0	U	0.01069	0.01069
1100-1200	0.019952	14.8	U	14.0	V	0.02025	0.01915
1200-1300	0.014787	14.8	U	13.5	V	0.01501	0.01369
1300-1400	0.00885	14.8	U	13.5	V	0.00898	0.00819
1400-1500	0.013847	14.8	U	13.5	V	0.01405	0.01282
1500-1600	0.016761	14.8	U	13.5	V	0.01701	0.01552
1600-1700	0.012937	14.8	U	14.0	V	0.01313	0.01242
1700-1800	0.012937	14.8	U	14.0	V	0.01313	0.01242
1800-1900	0.012058	14.8	U	14.0	V	0.01224	0.01158
1900-2000	0						
2000-2100	0						
<b>TOTALS</b>		<b>14.9</b>		<b>12.4</b>		<b>0.27638</b>	<b>0.22558</b>

U - Concentration from grab sample at top of Phase I drop tube

V - Concentration from continuous sample at base of UST vent.

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TABLE 6.2-19  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/18/98 to 9/19/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.10	29.90	35.0		No Data, Transition to ORVR Simulation w/o PV Valve
2200-2300	0.07	29.90	31.0		No Data, Transition to ORVR Simulation w/o PV Valve
2300-2400	0.15	29.90	31.0		No Data, Transition to ORVR Simulation w/o PV Valve
0000-0100	0.40	29.90	32.5		No Data, Transition to ORVR Simulation w/o PV Valve
0100-0200	0.35	29.90	35.0		No Data, Transition to ORVR Simulation w/o PV Valve
0200-0300	0.35	29.90	35.0		No Data, Transition to ORVR Simulation w/o PV Valve
0300-0400	0.00	29.90	18.5		Bulk Drop @ 0315, -0.65<system pressure<0.90
0400-0500	0.08	29.88	12.0	8.22430	Instrument Calibration 0430-0530
0500-0600	0.11	29.87	29.0	57.23900	
0600-0700	0.09	29.88	22.5	77.21700	
0700-0800	0.09	29.89	22.0	85.59000	
0800-0900	0.09	29.88	25.5	95.98300	
0900-1000	0.07	29.88	29.0	96.88100	
1000-1100	0.07	29.88	32.5	115.16000	
1100-1200	0.08	29.87	32.5	141.16000	
1200-1300	0.12	29.85	33.0	108.94000	Instrument Calibration 1230-1300
1300-1400	0.10	29.82	36.0	152.21000	
1400-1500	0.11	29.81	33.0	196.40000	
1500-1600	0.10	29.78	27.0	107.86000	
1600-1700	0.07	29.76	29.0	136.39000	
1700-1800	0.06	29.74	29.0	110.83000	
1800-1900	0.05	29.74	35.0	72.02400	
1900-2000	0.07	29.73	35.0	85.15400	
2000-2100	0.09	29.74	31.5	38.39400	Instrument Calibration 2000-2030
24 hr average	0.12	29.85	29.6		

24 Hour Vent Emission Mass (lbsx1000)	1685.66	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	5471	<b>34.6% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.3081	
System Efficiency Decrease (%)	3.67%	

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TABLE 6.2-20  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/19/98 to 9/20/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.10	29.74	31.0	100.79000	
2200-2300	0.13	29.74	30.5	107.99000	
2300-2400	0.12	29.74	34.0	123.41000	
0000-0100	0.15	29.74	38.5	138.32250	
0100-0200	0.10	29.74	38.5	138.32250	
0200-0300	0.10	29.74	38.5	138.32250	
0300-0400	0.10	29.74	33.5	138.32250	
0400-0500	0.08	29.74	37.0	83.98600	Instrument Calibration 0430-0445
0500-0600	0.09	29.74	34.0	111.86000	
0600-0700	0.08	29.74	27.0	71.23600	
0700-0800	0.06	29.75	21.0	40.14800	
0800-0900	0.06	29.75	22.0	63.63900	
0900-1000	0.05	29.76	23.0	41.17300	
1000-1100	0.04	29.76	28.0	51.87000	
1100-1200	0.04	29.76	27.0	64.92600	
1200-1300	0.00	29.75	25.0	31.70860	Instrument Calibration 1230-1300
1300-1400	0.06	29.74	21.0	97.85300	
1400-1500	0.04	29.72	18.5	58.55900	
1500-1600	0.04	29.71	25.0	72.22000	
1600-1700	0.01	29.71	31.0	32.54000	
1700-1800	0.03	29.70	32.5	86.06200	
1800-1900	0.02	29.70	33.5	36.77100	
1900-2000	0.02	29.71	20.5	328.87000	Bulk Drop @ 1910, -0.10<system pressure<0.45
2000-2100	0.03	29.72	3.5	1.81090	Instrument Calibration 2030-2100
24 hr average	0.06	29.74	28.1		

24 Hour Vent Emission Mass (lbsx1000)	2160.71	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	4718	<b>36.3% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.4580	
System Efficiency Decrease (%)	5.45%	

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TABLE 6.2-21  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/20/98 to 9/21/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.05	29.74	3.5	9.14140	
2200-2300	0.07	29.76	19.5	25.93600	
2300-2400	0.06	29.77	25.5	52.12800	
0000-0100	0.07	29.78	28.0	51.94800	
0100-0200	0.10	29.78	31.5	51.94800	
0200-0300	0.07	29.78	34.0	51.94800	
0300-0400	0.14	29.78	37.0	51.94800	
0400-0500	0.15	29.78	37.0	51.94800	Instrument Calibration 0430-0500
0500-0600	0.14	29.80	26.5	31.77690	
0600-0700	0.10	29.81	20.0	NA	
0700-0800	0.03	29.84	18.0	NA	
0800-0900	0.04	29.85	20.0	NA	
0900-1000	0.02	29.86	13.5	15.29800	
1000-1100	0.02	29.87	14.5	74.33400	
1100-1200	0.01	29.85	18.5	16.48700	Instrument Calibration 1100-1150
1200-1300	0.01	29.85	27.0	160.06700	
1300-1400	0.00	29.84	30.0	151.43000	
1400-1500	-0.02	29.82	29.0	163.91000	
1500-1600	-0.03	29.81	30.5	126.16000	Start UST Summa @ 1500
1600-1700	-0.04	29.80	34.0	91.70500	Stop UST Summa @ 1700
1700-1800	-0.04	29.80	30.0	52.96600	
1800-1900	-0.03	29.80	31.0	39.74300	
1900-2000	-0.01	29.81	34.0	89.94900	
2000-2100	0.00	29.82	32.0	89.62900	Instrument Calibration 2030-2100
24 hr average	0.04	29.81	26.0		

24 Hour Vent Emission Mass (lbsx1000)	1450.40	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	6801	<b>41.0% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.2133	
System Efficiency Decrease (%)	2.54%	

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TABLE 6.2-22  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/21/98 to 9/22/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.00	29.83	21.0	53.13200	
2200-2300	0.00	29.83	27.5	73.50000	
2300-2400	0.01	29.84	31.0	109.71000	
0000-0100	0.00	29.86	31.0	105.42000	
0100-0200	0.00	29.86	27.5	105.42000	
0200-0300	0.00	29.86	29.5	105.42000	
0300-0400	0.00	29.86	33.5	105.42000	
0400-0500	0.00	29.87	35.0	27.00500	Instrument Calibration 0430-0500
0500-0600	0.08	29.88	29.0	57.80000	
0600-0700	0.08	29.90	22.0	51.46400	
0700-0800	0.03	29.92	18.5	36.54500	Bulk Drop @ 0735, -0.40<system pressure<0.10
0800-0900	0.02	29.93	1.0	0.94909	
0900-1000	0.02	29.94	1.0	8.53140	
1000-1100	0.02	29.95	23.0	96.07000	
1100-1200	0.00	29.95	27.0	155.41000	
1200-1300	-0.01	29.94	30.0	102.57000	Instrument Calibration 1230-1300
1300-1400	0.04	29.93	27.5	178.71000	
1400-1500	0.05	29.91	28.0	167.20000	
1500-1600	0.06	29.90	24.0	136.24000	
1600-1700	0.06	29.89	20.0	98.02600	
1700-1800	0.07	29.89	26.5	78.86200	
1800-1900	0.08	29.89	26.0	71.47000	
1900-2000	0.10	29.91	28.0	82.98300	
2000-2100	0.08	29.92	18.0	15.28500	Instrument Calibration 2030-2100
24 hr average	0.03	29.89	24.4		

24 Hour Vent Emission Mass (lbsx1000)	2023.14	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	6480	<b>39.2% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.3122	
System Efficiency Decrease (%)	3.72%	

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TABLE 6.2-23  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/22/98 to 9/23/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.09	29.93	18.5	71.98500	
2200-2300	0.09	29.94	18.5	52.44400	
2300-2400	0.09	29.96	30.0	102.41000	
0000-0100	0.10	29.97	29.5	136.63750	
0100-0200	0.10	29.97	33.5	136.63750	
0200-0300	0.10	29.97	35.0	136.63750	
0300-0400	0.10	29.97	38.0	136.63750	
0400-0500	0.09	29.96	36.0	67.03300	Instrument Calibration 0430-0500
0500-0600	0.10	29.97	27.0	93.41800	
0600-0700	0.11	29.98	17.5	60.03800	
0700-0800	0.10	29.99	16.0	45.76100	
0800-0900	0.10	30.00	20.0	44.93300	
0900-1000	0.09	30.01	22.0	37.11500	
1000-1100	0.08	30.02	15.0	22.13300	
1100-1200	0.06	30.02	2.5	81.51100	Bulk Drop @ 1101, -0.20<system pressure<0.35
1200-1300	0.07	30.00	6.5	17.41380	Instrument Calibration 1230-1300
1300-1400	0.07	29.99	22.0	109.98000	
1400-1500	0.07	29.96	24.5	137.17000	
1500-1600	0.09	29.94	25.5	152.17000	
1600-1700	0.09	29.93	19.5	73.09600	
1700-1800	0.09	29.92	28.0	126.19000	
1800-1900	0.08	29.92	18.5	76.12100	
1900-2000	0.10	29.92	21.5	68.64600	Start UST Summa @ 2000
2000-2100	0.11	29.91	25.5	27.49500	Instrument Calibration 2030-2100
24 hr average	0.09	29.96	22.9		

24 Hour Vent Emission Mass (lbsx1000)	2013.61	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	6236	<b>40.6% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.3229	
System Efficiency Decrease (%)	3.84%	

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TABLE 6.2-24  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/23/98 to 9/24/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.06	29.93	24.5	80.51500	Stop UST Summa @ 2200
2200-2300	0.07	29.93	30.0	102.72000	
2300-2400	0.07	29.93	30.0	102.00000	
0000-0100	0.05	29.93	30.0	125.96500	
0100-0200	0.05	29.93	29.5	125.96500	
0200-0300	0.05	29.93	31.5	125.96500	
0300-0400	0.05	29.93	34.0	125.96500	
0400-0500	0.05	29.92	33.0	74.30700	Instrument Calibration 0430-0500
0500-0600	0.06	29.92	30.0	113.63000	
0600-0700	0.05	29.92	22.0	94.62500	
0700-0800	0.05	29.93	21.0	66.28600	
0800-0900	0.04	29.94	22.0	74.24800	
0900-1000	0.04	29.94	24.0	39.59000	
1000-1100	0.03	29.95	16.0	21.61800	
1100-1200	0.03	29.94	21.0	56.00800	
1200-1300	0.02	29.93	16.0	38.83300	Instrument Calibration 1230-1300
1300-1400	0.01	29.91	20.0	78.38600	
1400-1500	0.00	29.90	26.5	79.56600	
1500-1600	-0.02	29.88	17.0	10.53900	
1600-1700	-0.01	29.89	3.0	2.11500	
1700-1800	0.02	29.89	3.0	3.77390	
1800-1900	0.03	29.88	22.0	60.67700	
1900-2000	0.04	29.88	29.0	53.23500	
2000-2100	0.04	29.89	5.0	9.13990	Instrument Calibration 2030-2100
24 hr average	0.04	29.92	22.5		

24 Hour Vent Emission Mass (lbsx1000)	1665.67	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	7084	<b>37.8% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.2351	
System Efficiency Decrease (%)	2.80%	

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TABLE 6.2-25  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/24/98 to 9/25/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as C <sub>3</sub> H <sub>8</sub> )	Remarks
2100-2200	0.09	29.91	16.0	52.49900	Bulk Drop @ 2130, -0.95<system pressure<1.70
2200-2300	0.07	29.91	10.0	9.29350	
2300-2400	0.09	29.92	20.5	40.38100	
0000-0100	0.12	29.91	38.5	128.22250	
0100-0200	0.15	29.91	37.0	128.22250	
0200-0300	0.10	29.91	32.5	128.22250	
0300-0400	0.08	29.91	24.5	128.22250	
0400-0500	0.08	29.90	27.5	84.27800	Instrument Calibration 0430-0500
0500-0600	0.08	29.91	17.0	74.52800	
0600-0700	0.07	29.92	20.0	144.87000	
0700-0800	0.07	29.93	21.0	71.87400	
0800-0900	0.07	29.94	18.5	45.31500	
0900-1000	0.08	29.95	22.0	79.09800	
1000-1100	0.07	29.95	21.0	64.56600	
1100-1200	0.05	29.95	20.0	73.62400	
1200-1300	0.05	29.95	21.0	71.29100	Instrument Calibration 1230-1300
1300-1400	0.07	29.94	23.0	131.23000	
1400-1500	0.06	29.91	19.5	116.17000	
1500-1600	0.04	29.90	20.0	79.16000	
1600-1700	0.04	29.89	27.0	79.08300	
1700-1800	0.03	29.88	24.0	44.49800	
1800-1900	0.02	29.86	19.5	68.07800	
1900-2000	0.01	29.84	18.5	50.25100	
2000-2100	0.01	29.85	7.5	6.57280	Instrument Calibration 2030-2100
24 hr average	0.07	29.91	21.9		

24 Hour Vent Emission Mass (lbsx1000)	1899.55	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	6460	<b>39.2% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.2940	
System Efficiency Decrease (%)	3.50%	

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TABLE 6.2-26  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/25/98 to 9/26/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.06	29.84	22.0	117.53000	
2200-2300	0.08	29.83	25.0	67.79400	
2300-2400	0.07	29.83	21.0	90.94200	
0000-0100	0.06	29.79	30.0	153.97750	
0100-0200	0.05	29.79	31.5	153.97750	
0200-0300	0.05	29.79	22.0	153.97750	
0300-0400	0.06	29.79	22.0	153.97750	
0400-0500	0.07	29.76	35.5	72.71400	Instrument Calibration 0430-0500
0500-0600	0.08	29.75	31.0	110.56000	
0600-0700	0.05	29.76	21.0	86.52600	
0700-0800	0.05	29.77	15.0	34.55400	
0800-0900	0.03	29.77	11.0	23.40700	
0900-1000	0.03	29.78	7.0	8.57840	
1000-1100	-0.16	29.80	6.0	0.36312	Bulk Drop @ 1110, -1.18<system pressure<0.50
1100-1200	0.05	29.81	18.5	54.78800	
1200-1300	0.02	29.82	10.0	11.19000	Instrument Calibration 1230-1300
1300-1400	0.04	29.84	17.0	54.30300	
1400-1500	0.04	29.85	23.0	57.04200	
1500-1600	0.04	29.87	24.5	57.37200	
1600-1700	0.05	29.87	27.5	84.81000	
1700-1800	0.04	29.87	27.5	47.59200	
1800-1900	0.04	29.88	15.0	39.89800	
1900-2000	0.04	29.88	23.0	30.00300	
2000-2100	0.05	29.89	27.0	33.05700	Instrument Calibration 2030-2100
24 hr average	0.04	29.82	21.4		

24 Hour Vent Emission Mass (lbsx1000)	1698.93	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	5547	<b>36.0% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.3063	
System Efficiency Decrease (%)	3.65%	

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TABLE 6.2-27  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/26/98 to 9/27/98  
 ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.05	29.90	22.0	57.44300	
2200-2300	0.06	29.90	27.0	60.27300	
2300-2400	0.07	29.91	30.0	47.49900	
0000-0100	0.05	29.93	22.5	56.15500	
0100-0200	0.05	29.93	25.0	56.15500	
0200-0300	0.05	29.93	29.0	56.15500	
0300-0400	0.07	29.93	32.0	56.15500	
0400-0500	0.09	29.94	35.0	18.97830	Instrument Calibration 0430-0500
0500-0600	0.08	29.95	34.5	29.76700	
0600-0700	0.07	29.96	31.5	13.62700	
0700-0800	0.07	29.98	25.5	12.02700	
0800-0900	0.05	30.00	13.5	2.46730	
0900-1000	0.05	30.02	8.5	0.70591	
1000-1100	0.04	30.04	5.0	3.44720	
1100-1200	0.05	30.05	11.0	9.75940	
1200-1300	0.06	30.05	23.5	45.58800	Instrument Calibration 1230-1300
1300-1400	0.05	30.04	22.5	63.06800	
1400-1500	0.05	30.02	26.0	73.65300	
1500-1600	0.05	30.02	26.0	45.32700	
1600-1700	0.04	30.00	22.0	30.80200	
1700-1800	0.04	29.99	23.0	45.19100	
1800-1900	0.04	29.99	19.5	49.26500	
1900-2000	0.04	29.99	17.0	28.80900	Start UST Summa 2000
2000-2100	0.04	30.00	13.5	1.10040	Instrument Calibration 2030-2100
24 hr average	0.05	29.98	22.7		

24 Hour Vent Emission Mass (lbsx1000)	863.42	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	4996	<b>35.8% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.1728	
System Efficiency Decrease (%)	2.06%	

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**TABLE 6.2-28**  
**ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/27/98 to 9/28/98**  
**ORVR Simulation Testing minus P/V Valve, Raley Blvd., Sacramento**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.07	30.01	19.5	31.26600	Stop UST Summa 2200
2200-2300	0.09	30.01	25.0	42.74100	
2300-2400	0.09	30.01	26.5	35.51000	
0000-0100	0.10	30.01	28.0	58.56667	
0100-0200	0.10	30.01	31.5	58.56667	
0200-0300	0.10	30.01	31.5	58.56667	Bulk Drop @ 0305, -0.40<system pressure<0.78
0300-0400	0.00	30.01	3.0	58.56667	
0400-0500	0.00	30.01	4.0	29.28333	Instrument Calibration 0430-0500
0500-0600	0.09	30.00	19.5	106.17000	
0600-0700	0.07	30.00	18.5	62.70400	
0700-0800	0.06	30.01	22.0	118.96000	
0800-0900	0.04	30.02	16.5	88.22200	
0900-1000	0.05	30.02	24.5	122.10000	ORVR to Baseline Conversion 0900-0930
1000-1100	0.06	30.02	29.0	140.28000	Transition to Baseline w/o PV Valve
1100-1200	0.05	30.01	31.5	178.70000	
1200-1300	0.06	30.05	34.0	84.66900	Instrument Calibration 1230-1300
1300-1400	0.07	29.96	28.0	83.02600	
1400-1500	0.05	29.95	21.0	15.58700	
1500-1600	0.07	29.93	29.0	58.74700	
1600-1700	0.03	29.92	8.5	17.64500	
1700-1800	0.04	29.91	7.5	9.85270	
1800-1900	0.07	29.89	15.0	37.93400	
1900-2000	0.08	29.90	12.0	9.20970	
2000-2100	0.08	29.91	12.0	11.15400	Instrument Calibration 2030-2100
24 hr average	0.06	29.98	20.7		

24 Hour Vent Emission Mass (lbsx1000)	1518.03	
24 Hour Fugitive Emission Mass (lbsx1000)	NA	
24 Hour Product Throughput (gal)	6638	<b>26.9% of Product Throughput via ORVR Simulation</b>
Emission Factor (lb/1000 gal)	0.2287	
System Efficiency Decrease (%)	2.72%	

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TABLE 6.2-29  
 ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/28/98 to 9/29/98  
 Transition to Baseline Testing, minus P/V Valve, Raley Blvd., Sacramento

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.08	29.93	13.5	9.96410	
2200-2300	0.08	29.93	20.0	112.80000	
2300-2400	0.08	29.93	23.0	66.24300	
0000-0100	0.10	29.88	30.0	184.91250	
0100-0200	0.08	29.88	24.0	184.91250	
0200-0300	0.10	29.88	30.0	184.91250	
0300-0400	0.05	29.88	6.0	184.91250	Bulk Drop @ 0305, -6.50<system pressure<1.00
0400-0500	-1.85	29.86	5.0	0.14082	Instrument Calibration 0430-0500
0500-0600	0.02	29.88	9.0	21.94100	
0600-0700	0.03	29.88	12.5	22.22400	
0700-0800	0.03	29.90	12.5	22.63700	
0800-0900	0.05	29.91	25.0	88.74400	
0900-1000	0.06	29.91	34.0	48.07700	
1000-1100	0.06	29.92	38.5	33.56000	
1100-1200	0.04	29.92	43.0	111.78000	
1200-1300	0.02	29.91	41.0	58.23900	Instrument Calibration 1230-1300
1300-1400	0.05	29.89	38.5	102.81000	
1400-1500	0.05	29.87	33.0	85.39100	
1500-1600	0.04	29.87	17.0	37.19300	Start UST Summa 1515
1600-1700	0.04	29.87	10.0	27.70100	Stop UST Summa 1700
1700-1800	0.04	29.89	6.0	8.33450	
1800-1900	0.07	29.89	12.0	9.70270	
1900-2000	0.07	29.89	17.0	15.01800	
2000-2100	0.03	29.91	5.0	2.34650	Instrument Calibration 2030-2100
24 hr average	-0.02	29.90	21.1		

24 Hour Vent Emission Mass (lbsx1000)	1624.50
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	6279
Emission Factor (lb/1000 gal)	0.2587
System Efficiency Decrease (%)	3.08%

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**TABLE 6.2-30  
ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System  
Baseline Testing without P/V Valve, Wayne Vac Vapor Recovery System, 9/29/98 to 9/30/98**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.02	29.92	7.0	16.90900	
2200-2300	0.02	29.93	2.5	1.61850	
2300-2400	0.05	29.93	5.0	3.69800	
0000-0100	0.05	29.92	12.5	7.69125	
0100-0200	0.02	29.92	8.5	7.69125	
0200-0300	0.03	29.92	2.5	7.69125	
0300-0400	0.03	29.92	6.0	7.69125	
0400-0500	0.05	29.93	1.0	0.54429	Instrument Calibration 0430-0500
0500-0600	0.06	29.94	4.0	1.24650	
0600-0700	0.06	29.95	4.0	2.84950	
0700-0800	0.06	29.96	4.0	1.72330	
0800-0900	0.06	29.97	4.0	3.86950	
0900-1000	0.05	29.97	4.0	1.02750	
1000-1100	0.05	29.97	5.0	4.73470	
1100-1200	0.06	29.95	7.5	3.26090	
1200-1300	0.07	29.93	10.0	5.30450	Instrument Calibration 1230-1300
1300-1400	0.08	29.91	16.0	6.00520	
1400-1500	0.04	29.89	4.0	1.56910	
1500-1600	0.02	29.87	3.5	0.70650	
1600-1700	0.00	29.87	2.5	0.98031	
1700-1800	-0.01	29.88	1.0	1.18470	
1800-1900	0.00	29.89	1.0	0.71998	
1900-2000	0.01	29.90	0.5	0.84388	
2000-2100	0.02	29.91	0.5	0.66396	Instrument Calibration 2030-2100
24 hr average	0.04	29.92	4.9		

24 Hour Vent Emission Mass (lbsx1000)	90.22
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	6123
Emission Factor (lb/1000 gal)	0.0147
System Efficiency Decrease (%)	0.18%

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**TABLE 6.2-31  
ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 9/30/98 to 10/01/98  
Baseline Testing, minus P/V Valve, Raley Blvd., Sacramento**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	-0.49	29.93	1.0	0.01505	Bulk Drop 2105, -2.50<system pressure<0.20
2200-2300	0.03	29.93	2.5	0.71813	
2300-2400	0.05	29.93	7.0	11.68700	
0000-0100	0.02	29.94	10.5	5.01025	
0100-0200	0.03	29.94	8.5	5.01025	
0200-0300	0.03	29.94	7.0	5.01025	
0300-0400	0.03	29.94	9.5	5.01025	
0400-0500	0.04	29.95	7.5	2.26940	Instrument Calibration 0430-0500
0500-0600	0.05	29.95	5.5	6.46360	
0600-0700	0.04	29.96	2.0	5.04030	
0700-0800	0.05	29.96	2.0	3.00430	
0800-0900	0.05	29.98	5.0	5.14640	
0900-1000	0.03	29.99	2.5	2.14310	
1000-1100	0.02	30.01	2.5	2.28880	
1100-1200	0.04	30.01	2.5	2.00900	
1200-1300	0.03	30.00	3.5	4.45100	Instrument Calibration 1230-1300
1300-1400	0.03	29.99	7.5	14.69800	
1400-1500	0.01	29.96	15.0	43.33400	
1500-1600	0.03	29.95	5.0	8.68980	
1600-1700	-0.03	29.94	2.5	5.17460	
1700-1800	0.05	29.93	0.5	2.32070	Start UST Summa 1730
1800-1900	0.02	29.94	0.0	0.98605	
1900-2000	-0.01	29.93	0.0	1.43530	Stop UST Summa 1955
2000-2100	-0.01	29.95	0.0	0.20720	Instrument Calibration 2030-2100
24 hr average	0.01	29.96	4.6		

24 Hour Vent Emission Mass (lbsx1000)	142.12
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	6459
Emission Factor (lb/1000 gal)	0.0220
System Efficiency Decrease (%)	0.26%

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**TABLE 6.2-32  
ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 10/01/98 to 10/02/98  
Baseline Testing, minus P/V Valve, Raley Blvd., Sacramento**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	-0.01	29.96	0.0	0.81790	
2200-2300	0.00	29.97	0.0	0.44783	
2300-2400	0.01	29.98	0.0	0.79186	
0000-0100	-0.10	29.97	1.0	62.65750	
0100-0200	-0.10	29.97	4.0	62.65750	
0200-0300	-0.20	29.97	1.0	62.65750	Bulk Drop @ 0220, -0.58<system pressure<1.05
0300-0400	-0.15	29.97	1.0	62.65750	
0400-0500	0.01	29.96	1.0	2.85020	Instrument Calibration 0430-0500
0500-0600	0.05	29.97	10.0	4.60010	
0600-0700	0.06	29.97	7.5	4.81470	
0700-0800	0.05	29.97	7.5	1.81390	
0800-0900	0.05	29.98	7.5	4.30740	
0900-1000	0.05	29.98	5.0	3.30380	
1000-1100	0.05	29.99	5.0	1.52610	
1100-1200	0.05	29.99	5.0	2.73880	
1200-1300	0.04	29.98	6.0	0.78005	Instrument Calibration 1230-1300
1300-1400	0.04	29.96	12.5	4.20200	
1400-1500	0.03	29.94	11.0	2.93240	
1500-1600	0.01	29.93	5.0	1.90520	
1600-1700	0.01	29.91	3.5	0.76497	
1700-1800	0.01	29.90	3.0	0.30057	
1800-1900	0.00	29.90	1.5	0.11643	
1900-2000	0.01	29.91	1.5	0.41117	
2000-2100	0.00	29.91	1.5	0.35334	Instrument Calibration 2030-2100
24 hr average	0.00	29.96	4.2		

24 Hour Vent Emission Mass (lbsx1000)	290.41
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	7201
Emission Factor (lb/1000 gal)	0.0403
System Efficiency Decrease (%)	0.48%

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**TABLE 6.2-33  
ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 10/02/98 to 10/03/98  
Baseline Testing, minus P/V Valve, Raley Blvd., Sacramento**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.00	29.91	0.5	0.12036	
2200-2300	0.02	29.91	0.0	0.07220	
2300-2400	0.03	29.91	1.0	0.28013	
0000-0100	0.08	29.91	0.5	0.01690	
0100-0200	0.08	29.91	1.0	0.01690	
0200-0300	0.08	29.91	1.0	0.01690	
0300-0400	0.08	29.91	1.0	0.01690	
0400-0500	0.02	29.91	0.0	0.00000	Instrument Calibration 0430-0500
0500-0600	0.02	29.92	1.0	0.13082	
0600-0700	0.02	29.93	1.0	0.20425	
0700-0800	0.01	29.95	0.0	0.17740	
0800-0900	0.03	29.97	0.0	0.22454	
0900-1000	0.02	29.99	1.0	0.52897	
1000-1100	0.02	30.01	1.0	0.17512	
1100-1200	0.01	30.02	1.0	0.20292	
1200-1300	0.00	30.02	1.0	0.05991	Instrument Calibration 1230-1300
1300-1400	0.00	30.01	1.0	1.13490	
1400-1500	0.02	30.00	6.0	4.28390	
1500-1600	0.03	30.00	5.0	4.33610	
1600-1700	0.03	30.00	4.0	2.87940	
1700-1800	0.04	30.00	2.5	0.25920	
1800-1900	0.04	30.00	1.5	0.19420	
1900-2000	-0.26	29.99	1.5	0.06107	Bulk Drop 1915, -2.10<system pressure<1.00
2000-2100	0.04	30.00	0.0	0.00226	Instrument Calibration 2030-2100
24 hr average	0.02	29.96	1.4		

24 Hour Vent Emission Mass (lbsx1000)	15.40
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	5822
Emission Factor (lb/1000 gal)	0.0026
System Efficiency Decrease (%)	0.031%

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**TABLE 6.2-34  
ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 10/03/98 to 10/04/98  
Baseline Testing, minus P/V Valve, Raley Blvd., Sacramento**

Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	0.01	30.02	2.0	0.35901	
2200-2300	0.01	30.03	2.5	0.65578	
2300-2400	0.02	30.03	2.5	0.29823	
0000-0100	0.01	30.04	1.0	0.34295	
0100-0200	0.01	30.04	2.5	0.34295	
0200-0300	0.01	30.04	3.0	0.34295	
0300-0400	0.01	30.04	3.0	0.34295	
0400-0500	0.00	30.04	3.5	0.01277	Instrument Calibration 0430-0500
0500-0600	0.01	30.06	2.5	0.00000	
0600-0700	0.01	30.08	2.5	0.03467	
0700-0800	0.01	30.10	3.5	0.32726	
0800-0900	0.02	30.11	3.5	1.29900	
0900-1000	0.02	30.11	5.0	1.54560	
1000-1100	0.01	30.11	5.0	1.25480	
1100-1200	-0.03	30.11	3.5	5.73350	
1200-1300	0.01	30.10	3.5	2.27710	Instrument Calibration 1230-1300
1300-1400	0.03	30.09	7.5	15.76600	
1400-1500	0.03	30.05	2.5	9.57760	
1500-1600	0.03	30.04	1.0	2.82620	
1600-1700	0.03	30.03	1.0	3.24500	
1700-1800	0.01	30.02	0.0	0.62638	
1800-1900	0.02	30.02	0.0	0.03900	
1900-2000	0.02	30.02	0.0	0.05317	
2000-2100	-0.23	30.02	0.0	247.80000	Bulk Drop @ 2035, -2.65<system pressure<0.60
24 hr average	0.00	30.06	2.5		

24 Hour Vent Emission Mass (lbsx1000)	295.10
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	4933
Emission Factor (lb/1000 gal)	0.0598
System Efficiency Decrease (%)	0.71%

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**TABLE 6.2-35  
ORVR / Phase II Interaction Testing, Wayne Vac Vapor Recovery System, 10/04/98 to 10/05/98  
Baseline Testing, minus P/V Valve, Raley Blvd., Sacramento**

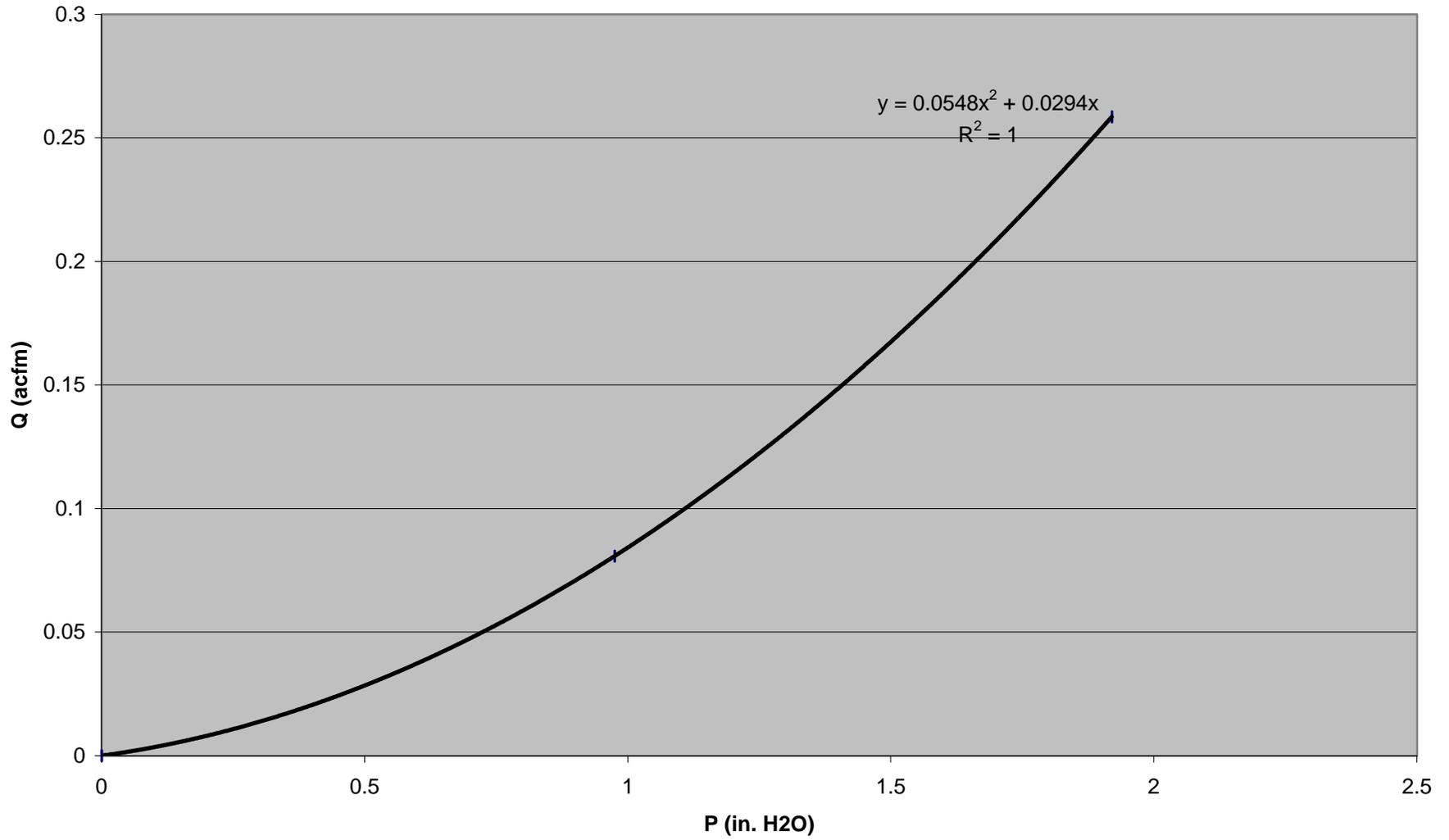
Time Period	System Pressure ("WC gage)	Barometric Pressure ("Hg)	Vent Conc. (% C <sub>3</sub> H <sub>8</sub> )	Vent Mass (10 <sup>3</sup> lbs as	Remarks
2100-2200	-0.16	30.02	2.5	82.86700	Instrument Calibration 2130-2200
2200-2300	0.04	30.02	1.0	0.00298	
2300-2400	0.04	30.02	1.0	0.18191	
0000-0100	0.04	30.01	2.5	3.71150	
0100-0200	0.04	30.01	2.5	3.71150	
0200-0300	0.04	30.01	5.0	3.71150	
0300-0400	0.04	30.01	2.5	3.71150	
0400-0500	0.05	30.00	1.0	0.33099	Instrument Calibration 0430-0500
0500-0600	0.07	30.00	1.0	0.05593	
0600-0700	0.07	30.02	1.0	0.06892	
0700-0800	0.06	30.04	1.0	0.32277	
0800-0900	0.04	30.06	1.0	0.21442	
0900-1000	0.04	30.07	1.0	0.07398	
1000-1100	0.04	30.07	1.0	0.10182	
1100-1200	0.03	30.08	1.0	0.20712	
1200-1300	0.04	30.08	2.0	0.34289	Instrument Calibration 1230-1300
1300-1400	0.03	30.06	1.0	0.42993	
1400-1500	0.03	30.04	2.5	0.82547	
1500-1600	0.02	30.03	1.0	0.21045	
1600-1700	0.01	30.02	2.5	0.51769	
1700-1800	0.01	30.01	1.0	0.32981	
1800-1900	0.02	30.01	1.0	0.06695	Start UST Summa 1835
1900-2000	0.03	30.01	1.0	0.08743	
2000-2100	0.04	30.01	1.0	0.13140	Stop UST Summa 2050
24 hr average	0.03	30.03	1.6		

24 Hour Vent Emission Mass (lbsx1000)	102.22
24 Hour Fugitive Emission Mass (lbsx1000)	NA
24 Hour Product Throughput (gal)	6186
Emission Factor (lb/1000 gal)	0.0165
System Efficiency Decrease (%)	0.20%

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FIGURE 6.2-1

Post Baseline Pressure Decay Test (9/14/98)  
Wayne Vac VRS, Sacramento



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FIGURE 6.2-2

Post ORVR Pressure Decay Curve (9/18/98)  
Wayne Vac VRS, Sacramento

